February 14, 1938

STEEL

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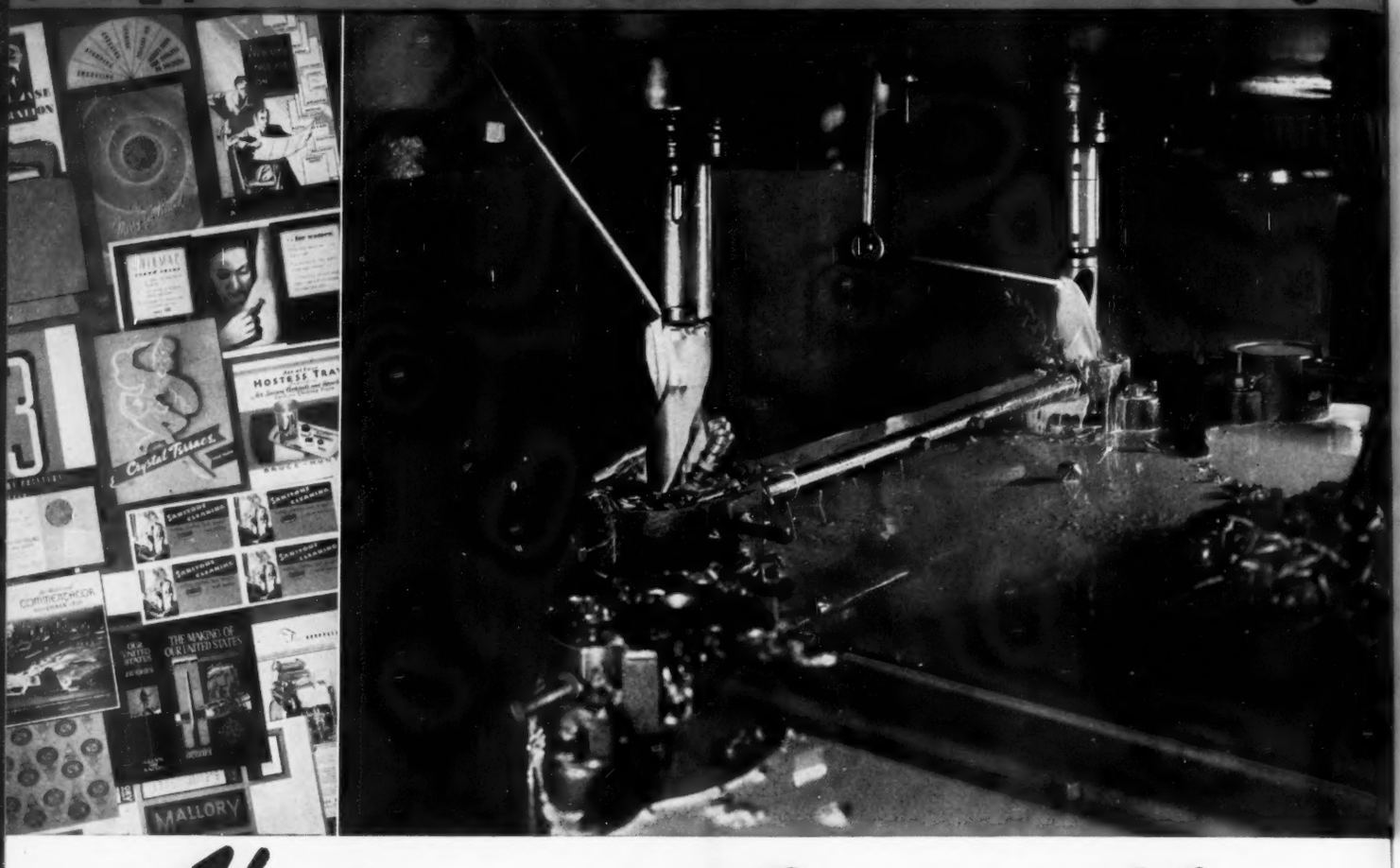

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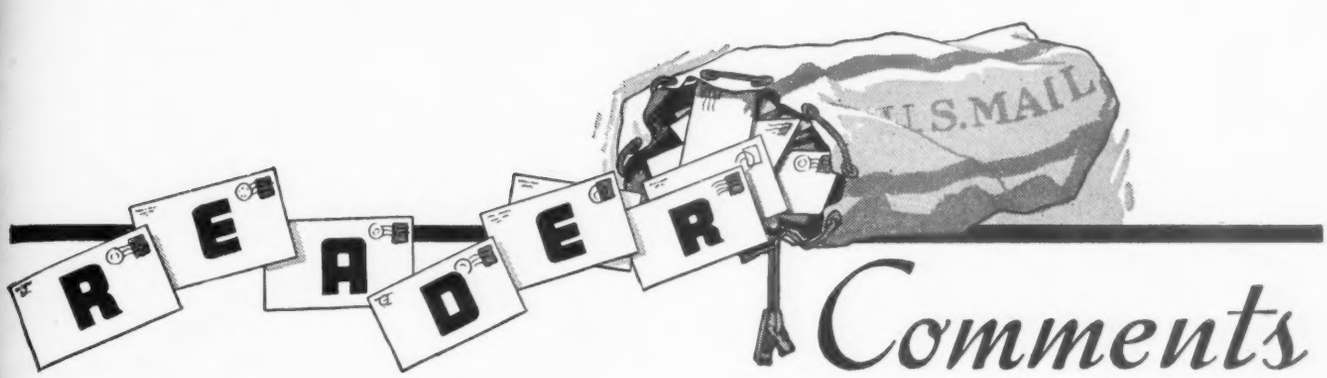


Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Has a Good Slogan

To the Editor:

That was rather a gloomy portrayal about the manufacturer of power lawn mowers Mr. Allen brought out on page 37 of the current issue. (A lawn-mower manufacturer converted his machine into a street sweeper, only to find municipalities are retrenching. STEEL, Feb. 7.)

We, too, are manufacturers of power mowers used on large estates and golf courses. But in contrast, and so your readers won't get the idea that the power mower industry is shot to pieces, we are glad to be able to report that our plant is running the full 44 hours per week and 1937 was the greatest year in our history.

This does not imply any indorsement of Mama's Boy because we are thoroughly fed up on all his policies and all his works, but we are going ahead regardless.

Just as a suggestion for a suitable slogan, why not: "1938 will reward intelligent courage."

K. E. GOIT

Sales Manager,
Toro Mfg. Corp.,
Minneapolis

Watch for This Rascal

To the Editor:

The December, 1937, issue of the *Protective Bulletin* by the American Bankers association contains a description of the activities of R. G. G———, alleged to be working a smooth game on machinery manufacturers and jobbers.

Thursday, Jan. 13, we received a telephone call, supposedly from a representative of a reliable contractors' equipment house, stating he was with Mr. G———, who was buying a large shovel from them. Mr. G——— wanted an electric light plant for his mine in Montana and wanted to know if we could furnish it, the message said. An appointment was made and he called Friday afternoon. After inspection of our stock he gave us an order for equipment to cost $2912.50 and tendered a certified check for $3000 from the Thompson Falls, Mont., State Bank. We gave him a check for the difference, $87.50, which he cashed with us, stating he was going to Chicago. Monday morning we were advised the check was a forgery.

G——— is between 45 and 50 years old, about 5 feet 10 inches, weather-beaten complexion, dark hair graying at the temples, neat appearing and knows considerable about mining and the country round Thompson Falls, Mont.

He spent almost all afternoon about our plant and anyone familiar with his method of operation would have ample time to make contact with the police department and cause his arrest. He appears to be specializing on supply houses or manufacturers.

C. D. AMMON

President,
Cushman Motor Works,
Lincoln, Nebr.

Bouquets

To the Editor:

We like your change in listing warehouse prices very much. The way you have the list now one can see at a glance the price of different commodities without looking over the whole page. We think it is quite a convenience.

E. B. JONES

L. F. Betts Supply Co.,
Quapaw, Okla.

Congratulations to you on the makeup of your warehouse steel prices, as shown in your edition of Jan. 24. This is quite valuable information for those concerned and we appreciate your interest in behalf of those having to do with the quoting of warehouse prices on iron and steel commodities.

S. P. GENTRY

S. P. Gentry & Co.,
Atlanta, Ga.

Didn't Nail Yearbook Down

To the Editor:

Will you please send me another copy of the Jan. 3 issue of STEEL. I did not have my copy nailed down and someone got away with it before I had finished reading it from cover to cover.

W. C. STERLING

Steubenville, O.

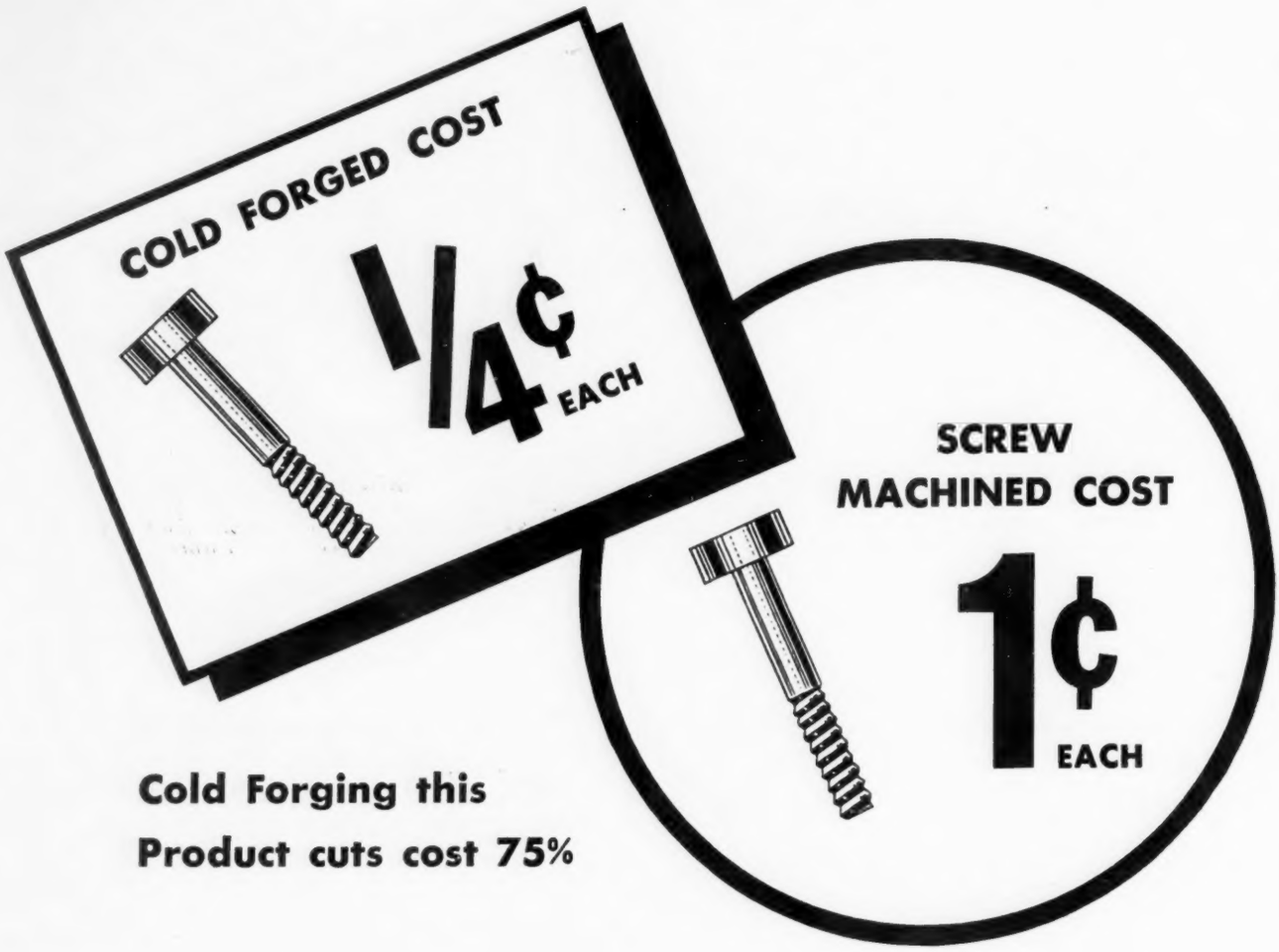
Getting Most From STEEL

To the Editor:

We acknowledge with thanks the pad of routing slips which you recently had printed for us. We find that these slips enable our organization to make more effective use of the trade magazines than if they were just handed round in haphazard fashion.

I. S. TAYLOR

Assistant Treasurer,
Aetna-Standard Engineering Co.
Youngstown, O.



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Published by THE PENTON PUBLISHING CO., Penton Building, Cleveland, Ohio. JOHN A. PENTON, Chairman of Board; E. L. SHANER, President and Treasurer; J. R. DAWLEY and G. O. HAYS, Vice Presidents; F. G. STEINEBACH, Secretary.

Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States, Cuba, Mexico and Canada, one year $4, two years $6; European and foreign countries, one year $10. Single copies (current issues) 25c.

Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879.
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STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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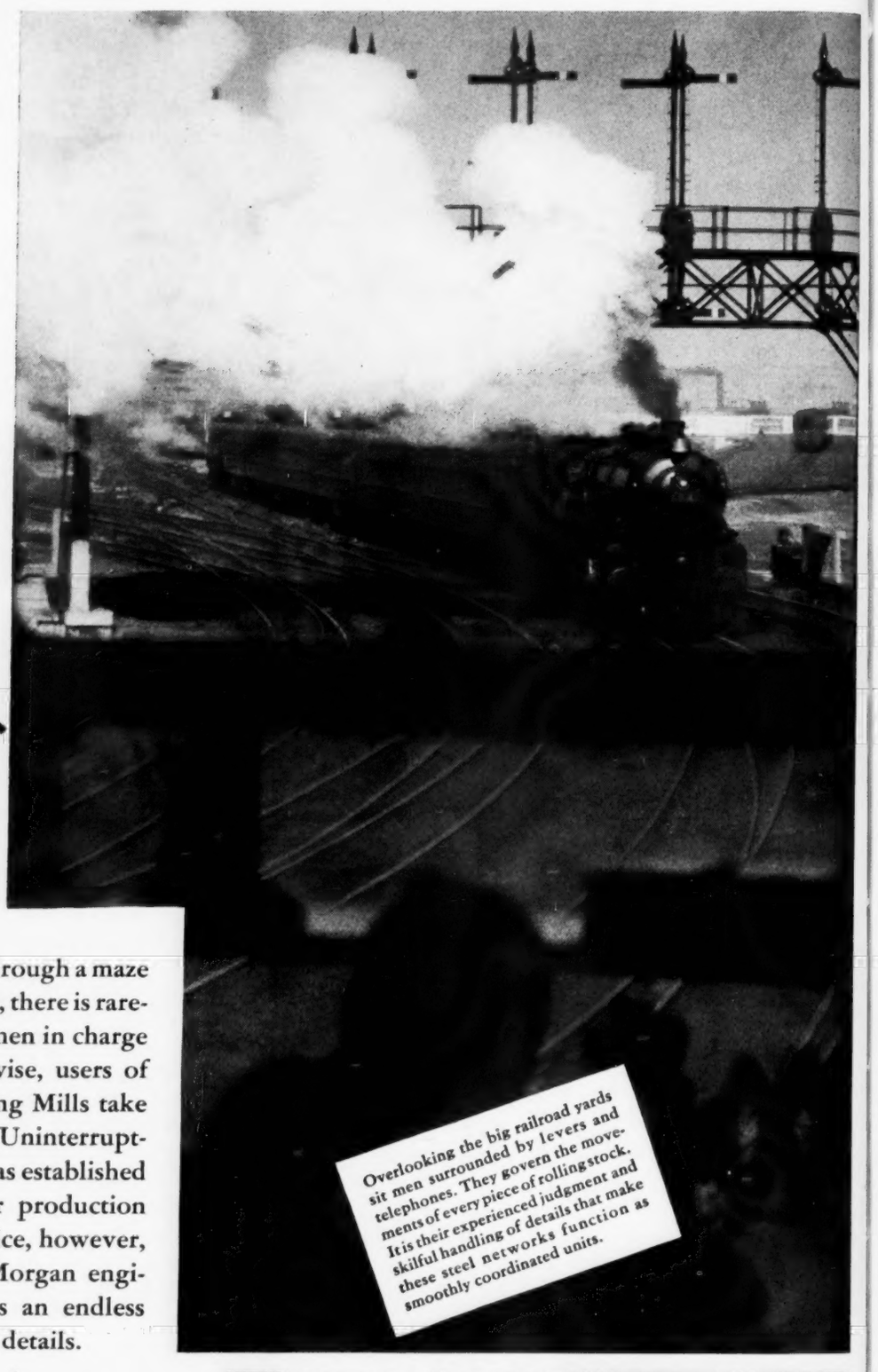
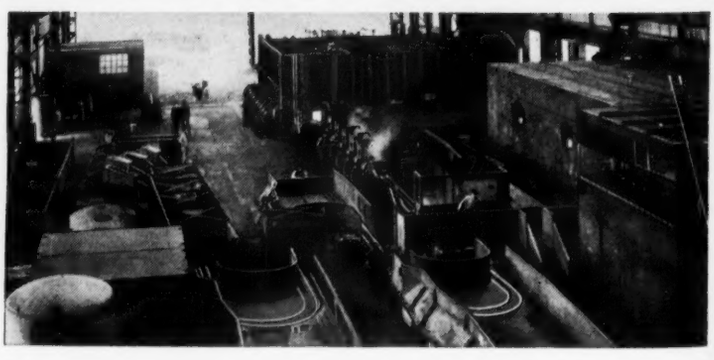


Overlooking the big railroad yards sit men surrounded by levers and telephones. They govern the movements of every piece of rolling stock. It is their experienced judgment and skilful handling of details that make these steel networks function as smoothly coordinated units.

As the Limited rolls in, through a maze of switch points and signals, there is rarely a thought given to the men in charge of levers and lives. Likewise, users of Morgan Continuous Rolling Mills take dependability for granted. Uninterrupted service, year after year, has established railroad regularity in their production schedules. Behind this service, however, is over half a century of Morgan engineering development, plus an endless capacity for perfecting the details.



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As the Editor Views the News

■ INDUSTRY'S chief weakness in 1933, 1934 and 1935 was its clumsy handling of public relations. It is not only imperative but entirely feasible to develop industrial statesmanship to a higher point of effectiveness than has been achieved heretofore. Politicians do not damn industry for the fun of it. They have been doing it with abandon during the past few years simply because it has been profitable from the standpoint of politics. Every competent industrialist should take it upon himself to do his part in explaining industry's position to the public. These were conclusions advanced at the fourteenth annual conference of the iron, steel and allied industries (p. 17) held by the California state chamber of commerce at Del Monte, Calif., Feb. 10-12.

♦ ♦ ♦

Favors Buying

A cheering note is sounded at Detroit. This is due mainly to substantial reduction (p. 20) of stocks of cars in dealers' hands. Too, automobile manufacturers (p. 31) regard as a favorable factor the reduction in the price of cold-rolled sheets . . . . Notable among the week's developments was the extension of contracts (p. 22) between the United States Steel Corp. and the Steel Workers Organizing committee. Either party, on 10 days' notice, may call a conference to propose revisions; if no agreement is reached within 20 days of the notice the entire contract is terminated automatically. SWOC will bargain only for its own members . . . . Production of steel for sale was 37,945,108 gross tons in 1937, an increase of 4½ per cent over 1936 (p. 28).

♦ ♦ ♦

Tata Honors Perin

Thirty years ago an Indian jungle infested with wild animals drew attention because it had been found to contain iron ore deposits in close proximity to coal. Today it is the site of the largest steelworks in the British empire and of the modern city of Jamshedpur, both created by a great American engineer and metallurgist. To honor the memory of the late Charles Page Perin, the Tata Iron & Steel Co. Ltd., has inaugurated (p. 27) a series of memorial lectures to be given by scientists of international reputation . . . .Contract has been placed for the construction of the "farthest north" modern blast furnace, (p. 27) at Glasgow, Scotland. It will be of American design, with nominal daily capacity of 500 tons.

♦ ♦ ♦

Annealing Cold Strip

Time and temperature cycles in annealing cold reduced strip require close operating control. There is little or no disagreement in the annealing specifications for surface and physical properties but (p. 40) the annealing setups vary considerably from mill to mill . . . . The regional foundry conference at Milwaukee, Feb. 3-4 (p. 48) was featured by a program divided into four sections dealing with gray iron, malleable iron, nonferrous and steel foundry practice. It is expected that this new type program will be followed in future regional meetings . . . . Three companies (p. 62) have merged production lines. One fabricates the metal parts, another supplies glass and a third does the finishing. Notable economies result . . . . A new process for plating aluminum and aluminum alloys (p. 64) is announced.

♦ ♦ ♦

Electrical Equipment

A variable-voltage car dumper of the lift-and-turnover type (p. 51) will handle an average of fifty 120-ton cars per hour. The electrical equipment is designed conservatively to deliver the dumper's full capacity continuously . . . A new automatic welder (p. 54) makes it possible to obtain the advantages of shielded arc welding in addition to those of continuous, automatic operation . . . . Much metal is consumed in air conditioning units. Practically all houses in the $7000 class and higher (p. 56) now specify air conditioning, as do also a large portion of those in lower cost brackets . . . . Heavy soldering operations in production work are facilitated (p. 61) by use of a simple device in which an air-acetylene torch is combined with a 6-pound copper.

E. L. Shaner

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● It had never been done, and many said it could not be done. But Ryerson, realizing the growing need for better, more uniform steel, began working on the problem.

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RYERSON STEEL-SERVICE

New Industrial Statesmanship Discussed At California Steel Conference

DEL MONTE, CALIF.

■ THREE HUNDRED delegates attended the opening session of the fourteenth annual conference, Iron Steel and Allied Industries of California, here last Thursday. This was near the record attendance, interest being heightened by a general discussion of current national economic problems.

The conferences are held under auspices of the California state chamber of commerce. E. H. McGinnis, Union Hardware & Metal Co., chairman, presided. Among the speakers were E. L. Shaner, editor-in-chief, STEEL, and T. M. Girdler, chairman, Republic Steel Corp., and president, American Iron and Steel institute.

"It is not only imperative, but entirely feasible to develop industrial statesmanship to a higher point of effectiveness than has been achieved heretofore," said Mr. Shaner, whose subject was "Industrial Statesmanship — Yesterday, Today and Tomorrow."

"This advanced form of statesmanship is a profession not limited to a few score top executives but is open to thousands of persons in the rank and file of industry—men in high and low positions in companies of small and moderate size, as well as those in the largest corporations. . .

"Industry's chief weakness in 1933, 1934 and 1935 was its clumsy handling of public relations. Its statesmanship was far below par. . .

"Politicians do not damn industry just for the fun of it. They have been doing it with abandon during the past few years simply because it has been profitable from the standpoint of politics to do so.

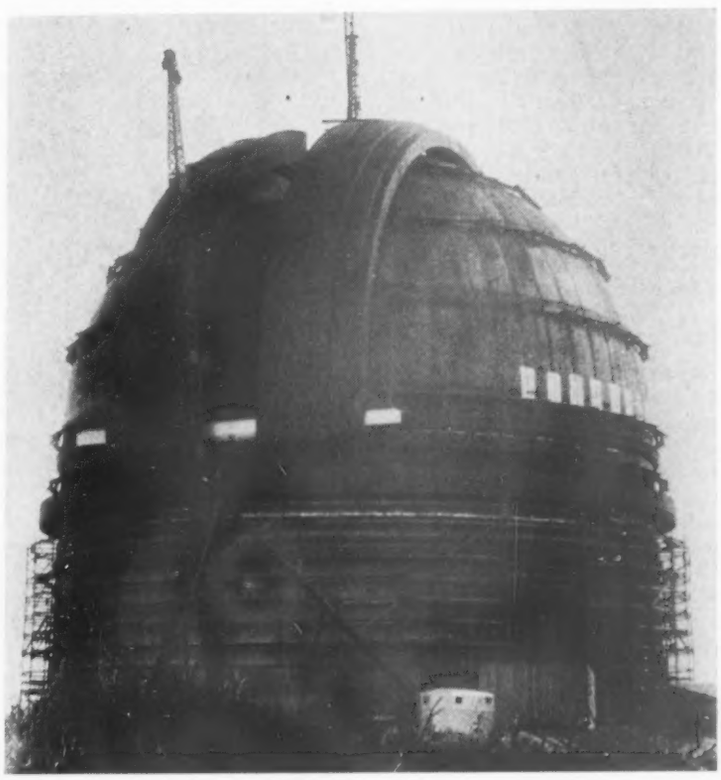
"We who are so earnestly solicitous of industry's good name probably could have done more for industry's cause if we had not taken our recent contest with politicians so seriously. Had we been more philosophical, had we studied the art of public relations more assiduously, we would have realized that in 1933, 1934 and 1935 our cue was simply to match wits with professional public relations experts who were working for politicians. We would have looked upon it as a game—and one in which the subtle arts of tact and diplomacy are more effective than bombast and frontal attack.

"What did we do? We massed all the pomp and dignity of industry's powerful organizations for a concentrated drive against the critics of industry. And in doing so we proved again that 'history teaches that man never learns anything from history'.

"By our mass attack we committed the unfortunate error of presenting too good a target to industry's critics. Our thrust reeked of too much pomp and ceremony. It did not register with the public because in the public mind it did not bear the stamp of sincerity. Politicians leaped at the unexpected opportunity to make new capital at industry's expense.

"The basic element of the new strategy is sincerity. A resolution passed by an organization of 1000 industrialists is not likely to impress the public as being a sincere document. The man-in-the-street knows that it was hatched by a small committee. Also he has learned to dis-

Steel Dome To Rotate with Largest Telescope



■ **Under this rotating steel dome, now nearing completion on Palomar mountain, San Diego county, California, will be housed the 200-inch reflecting telescope, world's largest, now being built. Eight hundred tons of steel are used in the dome. The entire rotating structure, 30 feet high and 137 feet in diameter, is welded, and no bolts or rivets used. Lower stationary structure was fabricated and erected more than a year ago by Consolidated Steel Corp. Ltd., Los Angeles. Cover plates in the dome were fabricated by Chicago Bridge & Iron Co. under subcontract with Consolidated**

count such resolutions in advance, feeling that they are issued purely as propaganda.

"But if each of the 1000 industrialists were to give his views independently, the man-in-the-street would be impressed. And this I believe is the key not only to the effectiveness of industry's present drive to win confidence, but also to the ultimate successful development of a new brand of industrial statesmanship.

"What we need today are frankness and simplicity in industry's public relations work. Every competent industrialist should take it upon himself to do his part in explaining industry's position to the public. Instead of thrusting the burden of spokesmanship upon a few willing leaders in each branch of industry, we should enlist thousands to the task.

"Furthermore, we should employ better judgment in directing our public relations effort. What do we gain by telling industry's story to persons who already know it by heart? Why waste a good speech on the members of a Union League club when there are converts to be made in the student body of the state university, or in the state convention of doctors or dentists, or in assemblies of other persons who do not understand industry's position?

"Please do not make the mistake of thinking that these groups do not want to hear industry's story. You would be surprised at the number of program committee chairmen who complain that although it is easy to get labor leaders, politicians or social workers to address their meetings, it is difficult to induce industrial executives to do so.

Challenge to Industry

"Here indeed is a challenge to industry. It is a challenge that the new statesmanship should meet promptly and effectively. It can be met easily by democratizing the function of public relations so that every competent industrialist, by his own initiative, becomes a self-appointed ambassador for the cause. . .

"With this improved basis of understanding, industry will be in a position to act more positively in discharging its obligations to society. In many instances it should be able to take the lead away from politicians in initiating sound social reforms."

Norman H. Sloane, general manager, state chamber of commerce, then described some of the efforts made by minority groups to promote unsound state legislation, particularly affecting taxes, and the need for combatting such measures.

The conference next heard Mr. Girdler speak on "Industrial Management Problems." In prefacing his address he refuted contentions that "high steel prices" have put the stop sign in the path of recovery.

"Those who propound the price reduction theory for steel," said Mr. Girdler, "are motivated by four assumptions.

"First, they assume price reductions would result in an immediate expansion of demand.

"Second, they assume steel prices are excessive and out of line with production costs.

"Third, they assume the industry could continue indefinitely its present wage level at a reduced level of prices.

"Fourth, they assume that profits in the steel industry are high. All of these asumptions are false," he declared.

Falling Markets Disturb Buyers

"It is traditional in the steel industry that unsettled and declining markets cause users of steel to withhold buying. When they feel that prices have stabilized, buying appears on a freer scale. The reason for that seems clear enough. Falling markets are always disturbing. Prudent manufacturers and fabricators want the benefit of the lowest price for their raw materials. . . ."

Because steel is manufactured largely on special order and to specification of the individual buyer, said Mr. Girdler, "a 'supply' of steel does not exist until called into being by specific demand."

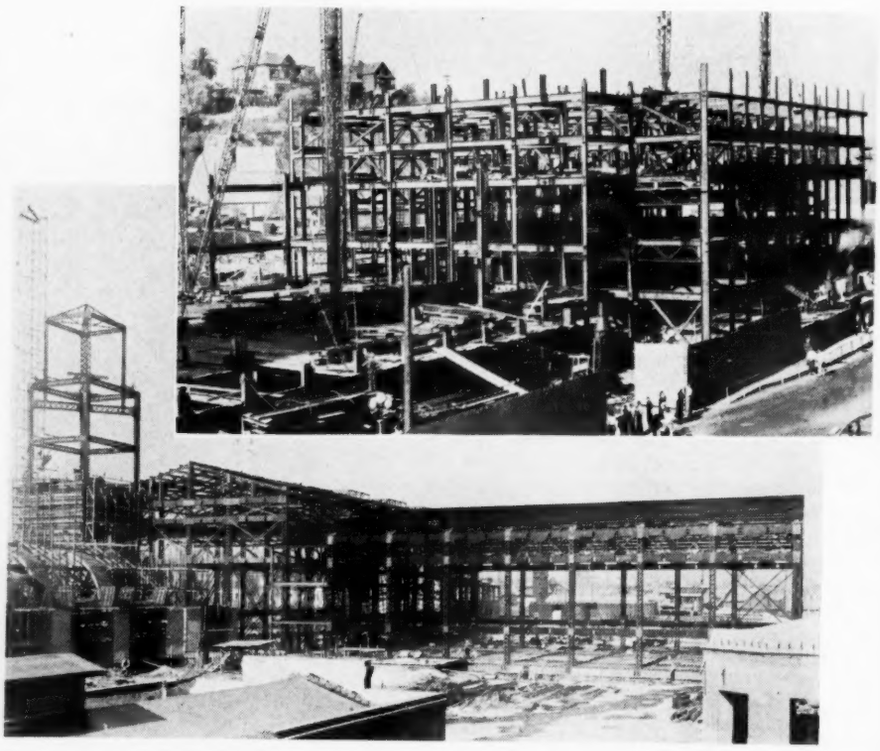
"There is not the slightest basis in my experience for believing that steel price reductions now would call into being a great surge of demand.

"One reason for this is that steel is a raw material and as such is only a minor part in the total cost of most products in which it is used. Changes in the price of steel, within the limits of reason, are not a controlling influence in affecting the demand by ultimate consumers of finished articles.

"As I figure it, a reduction of 10 per cent in the price of steel would result in a saving of only about $8 on the amount of steel going into the average automobile. A similar reduction would bring a saving of no more than $17 in the cost of steel going into a $400 home. . .

"The assumption that steel prices are excessive and out of line with

Steel To Hold "If the World Falls Apart"



■ **Latest of Los Angeles' notable buildings are these two now being erected—above, the federal building; and below, the union terminal. "Seismic bracing", and oversize beams, are used in the $7,280,000 federal building, tower of which will be 18 stories. "It will hold together if the world falls apart," said an engineer. In this structure are 16,000 tons of structural shapes and reinforcing steel. The terminal is an $11,000,000 project, taking 6000 tons of steel. Consolidated Steel Corp. Ltd., Los Angeles, supplied the 13,600 tons of structural shapes for the two buildings; various interests, the 8400 tons of reinforcing steel**

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T. A. L. Loretz, Pacific Coast Fabricating association, Los Angeles.	T. E. Banning, Columbia Steel Co., San Francisco.
TUBULAR	
Howard C. Fletcherm, Fretz-Moon Tube Co., Los Angeles.	N. B. Harmon, Columbia Steel Co., San Francisco.
D. D. Updegraff, Crane Co., Los Angeles.	J. D. Fleming, Grinnell Co. of the Pacific, San Francisco.
STEEL PLATE FABRICATORS	
J. A. Stever, National Tank Mfg. Co., Los Angeles.	George H. Raitt, Steel Tank Pipe Co., Berkeley.
William W. Mathews, Lacy Mfg. Co., Los Angeles.	George F. Bont, California Steel Products Co., San Francisco.

production costs is equally fallacious. We have the recent report of the assistant secretary of the navy that examination of the cost data of a steel company supplying material to the government showed that costs justified current prices and these prices, in his opinion, were fair.

"The present average price level approximates that of 1926, which has been frequently mentioned as a fair yardstick. Some are slightly above that level and some are slightly below. Many people forget that the average price of steel is under 3 cents a pound—less than almost any other important metal.

"In the last 15 months prices for steel have advanced 21 per cent and wages are 31 per cent higher. Compared with the low of 1932, steel prices have increased 33 per cent and wage rates 55 per cent. Today wage rates stand 25 per cent higher than in 1929.

"Wages comprise only one of the items of increased cost. It is hardly necessary to mention the item of taxes and in the offing is the possibility of substantial increases in freight rates, a matter of importance to a tonnage industry such as steel. . . .

"The average return on aggregate investment in the steel industry over the last ten years was only 3 per cent. Over no extended period for which there is any reliable record has the average annual return exceeded 5 per cent."

Prices must be related to costs, said Mr. Girdler, if a business is to continue to exist. "In the steel industry the most important single item of cost is labor. From 40 to 50 cents of each sales dollar goes directly into the pay envelope. For that reason wages and prices are inseparably linked. It would not long be possible for any steel company to maintain prices on a lower level while present wage rates remain unchanged. If industry were to be forced to pay wages it cannot afford, the whole industrial system would surely break down."

Briefly reviewing factors leading to the relapse in business, Mr. Girdler said: "As we stand near midway in February, industry shows some improvement and there are signs of further gains with the approach of spring. But many uncertainties still exist."

Mr. Girdler also commented briefly on the labor situation.

"Profit and Loss" was the subject of an address by Rev. Brewster Adams, Reno, Nev.

Group meetings were held in the afternoon, and in the evening two sound pictures were exhibited: "Steel," courtesy of the American Iron and Steel institute, and "Backbone of Progress," courtesy American Institute of Steel Construction."

B. J. Osborne, Moore Dry Dock Co., Oakland presided at the meeting Friday morning, featuring an "iron and steel clinic." Frederick J. Koster, California Barrel Co., San Francisco, spoke on "California's No. 1 Tax Problem as It Relates to Industry," and C. B. Tibbitts, Los Angeles Steel Casting Co., Los Angeles, on "How Industry Can Cooperate to Reduce Unemployment Insurance Costs."

Urges Rational Economy

"Sound business judgment suggests a rational economy—preconceived plan— for merchandising and distributing steel," said Walter S. Doxsey, executive secretary, American Steel Warehouse association, in addressing the group meeting on merchant steel.

"This is necessary to the correction of present deficiencies. Such a plan is equally important to safeguard the future of those who make, process, and distribute steel.

"There is too much competition within the industry . . . Steel products are priced by the mills on the basis of competition, rather than costs.

"From all these cross-purposes and inconsistencies arise the problems that have puzzled and confused you for years. They are perplexing alike to steel producers, fabricators, distributors, and to all consumers of steel.

"The steel industry has the ability to master its own problems. It has the intelligence and the foresight to develop a sound, long-range program for the merchandising and distribution of steel, a logical and equitable system which will eliminate many of our present costly malpractices, insure the economic future of essential collateral industries, and prove advantageous to consumers both large and small.

"Our first requisite is a uniformly sound and tenable sales policy applicable to all mill products and without deviation to all mill customers. With this as a foundation the fabricators and distributors and all other dependent industries may confidently rebuild their sales principles to attain rational and constructive competition."

Buying To Improve Shortly, Detroit's Reaction to Price Adjustment

DETROIT

■ FROM present indications it appears likely some important steel buying will develop shortly among automobile manufacturers. Recent price adjustments on cold-rolled sheets have served to clear the air appreciably and remove much of the hesitation which large consumers of steel were showing.

Present inventories of steel are ample to cover current production requirements, but if a sudden upturn in assembly schedules should develop there would be an immediate need for additional steel supplies. An increase in assemblies is predicated upon improvement in car buying; the latter, in turn, is influenced by the movement of used cars which in the last few weeks has shown a decided improvement.

Rate of new car production at present is around 200,000 per month. Normal rate of assemblies for this time of the year can be assumed to be 350,000 cars per month which means that a 75 per cent increase in present schedules would be necessary to reach a normal pace.

May Reduce New Cars

There is a general belief that prices of new cars are about to be reduced following the recent downward revision made by Packard. This should be a further stimulant to new car buying.

Thus, a combination of short inventories for normal production requirements, postponement of steel buying because of doubt on price trends, a sharp upturn in used car sales, and probability of an appreciable acceleration of assembly schedules leads to the belief that sizable tonnages of automobile steel will be released within the next two to six weeks.

Railroad Crisis Demands Early Relief, Warns Ayres

■ Increased taxes, wage and coal costs have brought the railroads to a new dilemma, Col. Leonard P. Ayres, business analyst and vice president, Cleveland Trust Co., told the Traffic Club of Cleveland at its annual dinner last week. More than 1000 steel, other industrial and transportation leaders attended.

Fundamental changes in transportation may result if 1938 proves to be a real depression year, Colonel Ayres warned. Railroads had "hoped to get increases in freight rates that would yield a little more than enough to cover these added expenses, and now this new depression has reduced the volume of their traffic by a greater percentage than they have asked to have their freight rates advanced," he said.

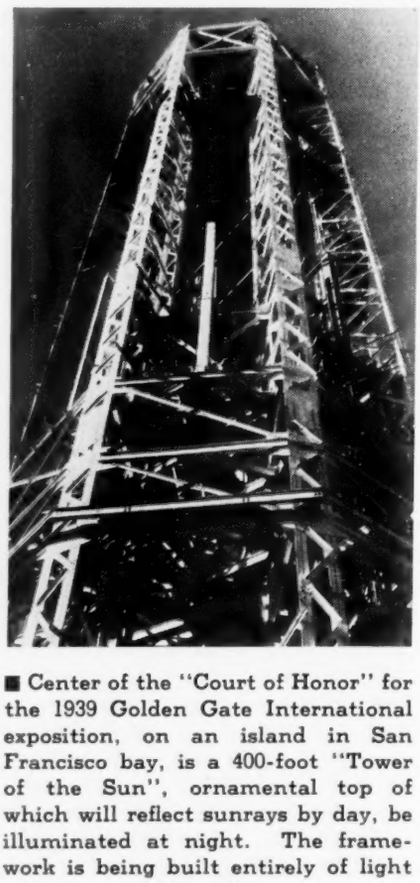
"It may well be that 1938 will prove to be the year in which the affairs of the railroads will become so complicated that the federal government, which has regulated them for the past 50 years, will finally undertake to find solutions for their problems," he continued.

Four Plans Proposed

"There are four types of plans, and numerous variations and combinations of them, that are proposed for the reorganization of the railroad industry. The first is government ownership; the second is compulsory consolidations into a limited number of great systems; the third is reorganization of all the weaker roads by means of new, rapid-action legislation; and the fourth and most inadequate is the plan to pool railroad earnings so as to have the prosperous roads pay the deficits of the poorer ones.

"It is a fair guess that a year from now some other speaker will address your 1939 dinner meeting, and that the topic of his discussion will be some one or more of those plans. The fundamental problem of our railroads cannot be allowed to go unsolved much longer."

Steel "Tower of the Sun"



■ **Center of the "Court of Honor" for the 1939 Golden Gate International exposition, on an island in San Francisco bay, is a 400-foot "Tower of the Sun", ornamental top of which will reflect sunrays by day, be illuminated at night. The framework is being built entirely of light steel sections**

Cartel Delegates Return to Europe

■ FOLLOWING a series of conferences in New York last week with officials of the Steel Export association, delegates of the European steel cartel sailed for home Friday night.

While the indicated intention of the delegation was to obtain firsthand information as to conditions of the steel industry in this country, and possibly to arrange some working agreement with American producers with respect to sale of certain products in world markets, full details as to what it was able to accomplish were not revealed.

American producers now participate in cartel activities on tin plate and pipe, and the products believed to have been considered were plates, shapes, bars and sheets. Due to the letdown in world demand for steel following an unusually active period, the foreign delegates, it was said, were interested in developing some arrangement whereby quotas would be established, and thus avert sharp competition.

Interest was heightened by the decline in domestic demand in the United States, and the possibility that American producers, therefore, might become increasingly aggressive in foreign markets.

Court Stays Minimum Coal Price Schedules

■ United States court of appeals for the District of Columbia last week issued an order staying minimum price schedules of the national bituminous coal commission until a final review can be had in the suits of 209 railroads, several midwestern mining companies and the city of Cleveland.

Court's opinion held in effect that the complaining companies had been denied an opportunity to appear before the commission and that the commission had published its schedules before it had prepared findings of fact to justify the minimum prices.

All the petitioners claim the minimum prices are in excess of prices hitherto paid and allow the producers more than a fair return. The mining companies claim the price schedules will cause them to lose valuable consumer markets.

January Ingots Gain 18 Per Cent

■ PRODUCTION of steel ingots in January amounted to 1,732,266 gross tons, 18 per cent more than the 1,472,241 tons in December, according to the American Iron and Steel institute.

This was the lowest January tonnage in 20 years, excepting 1932 and 1933. It compares with 4,724,894 tons in January, 1937.

The industry operated at 29.14 per cent of capacity in January, compared with 25.36 in December and 81.43 per cent in January, 1937. Weekly output averaged 391,031 tons, against 333,086 tons in December, and 1,066,567 tons in January, 1937.

The average rate of operation for January—29.14 per cent—computed by the institute on the basis of actual production, compares with 29.35 per cent, the average of STEEL'S weekly estimates of operations.

As the basis of computing rate of operations for 1938 the institute has raised open-hearth capacity to 63,524,356 gross tons as of Dec. 31, 1937, from 62,160,362 tons as of June 30, 1937. Bessemer capacity has been increased to 6,440,000 tons from 6,325,000 tons.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Feb. 12	Change	Same week 1937	Same week 1936
Pittsburgh ..	32	— 1	84	40
Chicago	25	None	80	59.5
Eastern Pa...	30	None	54.5	37
Youngstown..	23	— 3	80	62
Wheeling	44	None	80	84
Cleveland ...	33	None	76.5	66.5
Buffalo	18.5	+ 4.5	85	34
Birmingham..	61	— 2	76	63
New England.	27	+ 7	88	83
Cincinnati ...	28	—16	30	80
St. Louis.....	21	— 8	82	†
Detroit	47	None	86	94
Average....	30	— 1	81	54.5

†Not reported.

1937 Railway Equipment Exports Up 77 Per Cent

■ Exports of railway equipment from the United States in 1937 were valued at $12,917,387, an increase of 77 per cent over $7,296,648 in 1936, according to the transportation division, department of commerce. This was the best total since 1930 when the value reached $15,000,234. The tabulation includes locomotives and parts, passenger and freight cars and parts, motor railcars, street cars and trolley buses, airbrake equipment, railway signals and attachments and car heating equipment.

In 1937 car parts, except wheels and axles, showed the highest value, $2,965,604, followed by 1726 freight cars of over 10 tons capacity, valued at $2,762,447. Locomotive parts and accessories totaled $1,660,688, and 53 steam locomotives were valued at $1,317,179.

Steel Ingot Statistics

Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 98.29 per cent in 1936

1938	—Open Hearth— Gross tons	Per cent of capacity	—Bessemer— Gross tons	Per cent of capacity	— Total — Gross tons	Per cent of capacity	Weekly production, all companies, gross tons	Number of weeks in month
Jan.....	1,632,275	30.24	99,991	18.27	1,732,266	29.14	391,031	4.43
1937								
Jan.	4,433,145	84.20	291,749	54.29	4,724,894	81.43	1,066,567	4.43
Feb.	4,082,163	85.87	331,669	68.35	4,413,832	84.25	1,103,458	4.00
March ...	4,812,879	91.42	403,364	75.06	5,216,243	89.90	1,177,481	4.43
April	4,681,677	91.83	388,768	74.70	5,070,445	90.24	1,181,922	4.29
May	4,767,269	90.55	382,582	71.19	5,149,851	88.76	1,162,495	4.43
June	3,899,190	76.48	284,572	54.68	4,183,762	74.46	975,236	4.29
July	4,220,561	80.09	335,440	62.56	4,556,001	78.48	1,030,769	4.42
Aug.	4,502,243	85.25	373,428	69.49	4,875,671	83.79	1,100,603	4.43
Sept.	4,029,921	78.98	268,433	51.70	4,298,354	76.46	1,004,288	4.28
Oct.	3,203.447	60.66	189,244	35.22	3,392,691	58.31	765,844	4.43
Nov.	2,040,020	39.89	113,761	21.86	2,153,781	38.22	502,047	4.29
Dec.	1,385,406	26.29	86,835	16.20	1,472,241	25.36	333,086	4.42
Total	46,057,921	74.21	3,449,845	54.54	49,507,766	72.39	949,516	52.14

Percentages of capacity operated for 1938 are calculated on weekly capacities of 1,218,342 gross tons of open-hearth ingots and 123,514 gross tons of bessemer ingots, total 1,341,856 gross tons; based on annual capacities as of Dec. 31, 1937, as follows: Open-hearth ingots, 63,524,356 gross tons; bessemer ingots, 6,440,000 gross tons.

Percentages of capacity for the first six months of 1937 are calculated on weekly capacities of 1,188,452 gross tons for open-hearth ingots, 121,308 tons for bessemer and 1,309,760 tons total, based on annual capacities as of Dec. 31, 1936, as follows: Open-hearth ingots, 61,965,862 gross tons; bessemer, 6,325,000 tons; beginning July 1, 1937, on weekly capacities of 1,192,182 gross tons open-hearth ingots and 121,308 gross tons bessemer, total 1,313,490 gross tons; based on annual capacities as follows: Open-hearth ingots, 62,160,362 gross tons; bessemer, 6,325,000 gross tons.

PRODUCTION

■ ADJUSTMENTS by steel producers to keep pace with slow buying brought a decline of 1 point last week in the national operating rate, to 30 per cent.

Central eastern seaboard — Unchanged at 30 per cent. At least one plant is planning to take off a furnace in the next few days.

Cincinnati—Down 16 points to 28 per cent, because of staggered operations, as mills accumulate orders.

Detroit—Steady at 47 per cent, with 10 of 21 open hearths operating.

Buffalo—Gain of 4½ points to 18½ per cent, one interest adding two open hearths.

Pittsburgh—Loss of 1 point to 31 per cent, due to revisions of schedules both upward and downward.

Wheeling—No change in rate of activity from 44 per cent. Expectation is for the same rate this week.

St. Louis—Drop of 8 points to 21 per cent, the level of January.

New England—Advance of 7 points to 27 per cent, the first rise since the second week in January. Indications are the rate will hold this week.

Chicago — Slight adjustments brought no change in the operating rate, which remains at 25 per cent.

Birmingham, Ala. — Open-hearth activity last week was at 61 per cent, loss of one furnace by one producer being balanced by an addition by another.

Youngstown, O. — Decline of 3 points to 23 per cent was registered last week. This rate is expected to hold this week. Irregular operations by all producers cause frequent changes in rate.

Cleveland — Production continues unchanged at 33 per cent, with a slight dip probable for this week.

Student Bridge Design Contest Jury Selected

■ Designs for an elevated highway submitted in the students' bridge design competition sponsored annually by the American Institute of Steel Construction will be judged April 19 by a jury of five engineers and architects.

Members of the jury are: Frank M. Masters, consulting engineer, Harrisburg, Pa.; E. H. Praeger, chief engineer, Madigan-Hyland, New York; Aymar Embury II and Randolph Evans, architects, New York; and Howard Myers, editor, *The Architectural Forum.*

Competitors must submit designs on or before April 9. (See also STEEL, Jan. 24, p. 20.).

LABOR

U. S. STEEL EXTENDS SWOC AGREEMENTS INDEFINITELY

■ Extension of contracts between the United States Steel Corp. subsidiaries and the Steel Workers Organizing committee, as agreed to Feb. 9, is for an indefinite period.

Only major change is a proviso that either party may on ten days' notice call a conference to propose revisions. If no agreement is reached within 20 days of the notice, the entire contract is automatically terminated.

Under the agreements SWOC is recognized as the collective bargaining agency for only those employes who are members of the Amalgamated Association of Iron, Steel and Tin Workers. Thus the subsidiaries reaffirm their open shop policy.

Employes continue to have the right to join or not to join a labor organization, free from interference or coercion from any source.

Wage rates, hours and working conditions continue the same as under the 1937 agreements. These wages are based on a $5 daily minimum for an 8-hour day, or a base rate of 62½ cents an hour. Standard work week is 40 hours of five 8-hour days. Time and one-half for overtime is provided.

Subsidiary Heads Sign

Those who signed the extension agreements for the Steel corporation's subsidiaries are J. L. Perry, president, Carnegie-Illinois Steel Corp.; Clifford F. Hood, president, American Steel & Wire Co.; C. R. Cox, vice president, National Tube Co.; Robert Gregg, president, Tennessee Coal, Iron & Railroad Co.; and A. N. Diehl, president, Columbia Steel Co.

Philip Murray, chairman; David J. McDonald, secretary-treasurer; Van A. Bittner, director, western region; Clinton S. Golden, director, north-eastern region; William Mitch, director, southern region; and Lee Pressman, general counsel, signed for SWOC.

Extension of the agreements was announced in New York by B. F. Fairless, Steel corporation president.

Amended section provides: "The 1937 agreements shall continue until changed or terminated as follows: Either party may, subsequent to Feb. 28, 1938, at any time and from time to time give ten days written notice to the other party of the time for commencement of a conference of the parties for the purpose of negotiating the terms and conditions of a change of the 1937 agreements, which conference shall be at the office of the corporation in Pittsburgh, unless otherwise mutually agreed, and

"If, because of a failure to agree, the 1937 agreements are not changed by a written agreement entered into by the corporation and the union within 20 days from the giving of said notice, then the 1937 agreements and all the provisions thereof, shall terminate upon the expiration of 20 days from the giving of said notice."

Hot Dip Galvanizers To Convene in Pittsburgh

■ American Hot Dip Galvanizers association Inc. will hold its annual meeting at the William Penn hotel, Pittsburgh, Feb. 24. All members of the industry, regardless of association membership, are invited to attend. Plans and programs for the coming two years will be discussed, including continuation of the group advertising campaign. Officers and directors will be elected. Stuart J. Swensson, 903 American Bank building, Pittsburgh, is association secretary.

Develops All-Steel Farm Buildings for Government

■ Prefabricated all-steel farm buildings, developed by the Tennessee Coal, Iron & Railroad Co. and the Decatur Iron & Steel Co., Decatur, Ala., in co-operation with the farm security administration, were opened for public inspection last Friday, at Greenbelt, Md.

It has been estimated the entire group, including five-room house, barn, poultry house and smokehouse, can be delivered unassembled for approximately $2000.

Structures were built of prefabricated panels of galvanized copper-bearing steel, welded to light cold-rolled steel structural members. A novel system of attaching the buildings to their foundations has been utilized. A bearing plate, welded, to two hot-rolled channels, forms the supporting pier. The floors are carried on welded built-up girders.

Historic Furnace Razed

■ **Stack 2 of Carnegie-Illinois Steel Corp.'s Lucy blast furnace, Pittsburgh, was pulled down recently. This stack was built in 1877 by the Lucy Furnace Co. and later acquired and enlarged by Carnegie, Phipps & Co., which merged with Carnegie Steel Co. No. 1 stack was dismantled Dec. 3**

Pay Tribute to Four Cleveland Inventors

■ National inventors day was celebrated in Cleveland, Feb. 11, with a luncheon meeting conducted by the Cleveland chamber of commerce. The date was the late Thomas A. Edison's birthday.

Tributes were paid to the memory of four Cleveland inventors: Samuel T. Wellman, who invented open-hearth charging and other machinery; G. H. Hulett, who developed automatic ore unloaders; Charles F. Brush, noted inventor in the electrical field, and Alexander E. Brown, inventor of car dumpers and ore unloading buckets.

Waldemar B. Kaempffert, science editor, *New York Times*, principal speaker, declared that social science has not kept up with the machine age but expressed confidence needed solutions will come in the course of time and without abandoning our democratic system.

Steel Corp. Shipments Gain in January

■ Shipments of finished steel products by the United States Steel Corp. in January were 518,322 tons, a gain of 29,252 tons over the 489,070 tons shipped in December, or 5.98 per cent. Compared with January, 1937, shipments of 1,149,918 tons the decrease was 631,596 tons, or 55 per cent. Further comparisons are to be found in the accompanying table.

U. S. STEEL CORP. SHIPMENTS
(Inter-company shipments not included)
(Tons)

	1938	1937	1936	1935
Jan.	518,322	1,149,918	721,414	534,055
Feb.	.....	1,133,724	676,315	583,137
Mar.	.....	1,414,399	783,552	668,056
April	.....	1,343,644	979,907	591,728
May	.....	1,304,039	984,097	598,915
June	.....	1,268,550	886,065	578,108
July	.....	1,186,752	950,851	547,794
Aug.	.....	1,107,858	923,703	624,497
Sept.	.....	1,047,962	961,803	614,933
Oct.	.....	792,310	1,007,417	686,741
Nov.	.....	587,241	882,643	681,830
Dec.	.....	489,070	1,067,365	661,515
Y'rly adj.	.....	.....	†40,859	†23,750
Total	.....	12,825,467	10,784,273	7,347,549

†Deduction.

FINANCIAL

■ Continental Steel Corp., Kokomo, Ind., reports 1937 net income as $814,553, compared with $736,228 in 1936. This was equal to $3.20 a share on the no-par common, against $2.75 a share in 1936.

Virginia Iron, Coal & Coke Co., Roanoke, Va., reports a net loss of $88,271 for the 12 months ending Dec. 31. A loss of $88,404 was incurred in the same period a year previous.

Continental Can Co. Inc., New York, has declared the regular quarterly dividend of $1.12½ per share on the $4.50 cumulative preferred stock, payable April 1 to holders of record March 10. Directors also reported net earnings for 1937 of $8,721,025 equivalent to $3.06 a share on 2,853,971 common shares of $20 par value. This compares with net earnings of $9,038,787 or $3.17 a common share in the previous year.

Interlake Steamship Co., Cleveland, has declared a dividend of 25 cents a share on common, payable April 1 to record March 15. Last year the company paid 50 cents a share in April, 50 cents in July, $1.50 in October, and $2.50 in December.

Timken-Detroit Axle Co., Detroit, declared the regular quarterly dividend of $1.75 a share on preferred stock, payable March 1 to record Feb. 21.

Timken Roller Bearing Co., Canton, O., has declared a cash dividend of 25 cents a share, payable March 5 to stock of record Feb. 16. In 1937 the company paid four quarterly dividends of 75 cents each with extras of 25 cents Sept. 4 and $1.75 on Dec. 4.

Ingersoll Rand Co., New York, has declared a dividend of $1.50 a share on common stock, payable March 1 to record Feb. 7. Amount is same as that paid in December.

Worthington Pump & Machinery Corp., Harrison, N. J., has declared regular quarterly dividends of $1.12½ a share on the 4½ per cent cumulative prior preferred and 4½ per cent convertible prior preferred, both payable March 15 to record March 4.

Industrial Fish Story

■ Mr. Fish, American Steel & Wire Co., Worcester, Mass., recently called Mr. Pike, Hanson-Van-Winkle-Munning Co., Matawan, N. J., who called Mr. Herring of the Hanson-VanWinkle-Munning Co. of Pittsburgh, who called Mr. Trout, Bethlehem Steel Co., Johnstown, Pa., to make an appointment between Mr. Fish and Mr. Trout.

The appointment was made, but who caught what and how big it was, no one will ever find out!

Authority for this "true story": C. W. Yerger, vice president, Hanson-VanWinkle-Munning Co.

Average Earnings of Consumers, Suppliers Up 15%

■ Net earnings of 33 identical companies among equipment manufacturers, suppliers and other leading iron and steel consumers increased 15 per cent in 1937, compared with the preceding year. In the following tabulation all figures are net earnings, except where asterisk denotes loss.

	Year 1937	Year 1936
Ohio Seamless Tube Co., Shelby, O.	$ 158,554	$ 17,028
Foote-Burt Co., Cleveland	94,380	231,275
Monarch Machine Tool Co., Sidney, O.	436,524	258,078
American Stamping Co., Battle Creek, Mich.	74,099	53,301
American Steel Foundries, Chicago	3,617,761	2,953,426
Chapman Valve Co., Indian Orchard, Mass.	770,448	360,666
Jaeger Machine Co., Columbus, O.	522,686	412,052
Transue & Williams Steel Forging Corp., Alliance, O.	90,195	66,621
American Brake Shoe & Foundry Co., New York	3,410,798	2,351,968
Viking Pump Co., Cedar Falls, Iowa	323,657	288,363
Michigan Steel Tube Products Co., Hamtramck, Mich.	429,779	373,345
A. M. Castle & Co., Chicago	958,932	559,377
Ferry Cap & Set Screw Co., Cleveland	117,394	26,261
Savage Arms Corp., New York	456,616	245,752
Buckeye Steel Castings Co., Columbus, O.	1,045,744	882,219
American Spring & Mfg. Corp.,	41,156	92,408
Landis Machine Co., Waynesboro, Pa.	98,624	83,880
Cleveland Hobbing Machine Co., Cleveland	116,569	135,074
Automatic Voting Machine Corp., Jamestown, N. Y.	364,747	221,853
Caterpillar Tractor Co., Peoria, Ill.	10,168,689	9,849,592
American Stamping Co., Cleveland	73,325	53,350
Bliss & Laughlin Inc., Harvey, Ill.	659,881	667,583
Lunkenheimer Co., Cincinnati	774,743	568,550
Pittsburgh Coal Co., Pittsburgh	*1,050,799	*1,684,955
Cockshutt Plow Co., Toronto	668,041	348,682
National Bearing Metals Corp., St. Louis	522,205	701,211
Blaw-Knox Co., Pittsburgh	2,379,692	1,548,176
Continental Can Co. Inc., New York	8,721,025	9,038,787
Murray Ohio Mfg. Co., Cleveland	228,264	302,254
Electric Controller & Mfg. Co., Cleveland	926,484	812,918
Harbison-Walker Refractories Co., Pittsburgh	3,140,233	3,462,483
J. G. Brill Co., Philadelphia	541,593	216,516
Chain Belt Co., Milwaukee	743,833	630,899

Report Progress In Steel Castings

■ ABOUT 150 attended the thirty-sixth annual meeting of the Steel Founders' Society of America, Hotel Statler, Cleveland, Feb. 9-10. Considerable progress was reported by divisional chairmen heading groups concerned with improving quality of steel castings.

F. A. Lorenz Jr., American Steel Foundries, Chicago, spoke on foundry and general economic conditions. Chauncey Belknap, counsel for the society, described recent legislation. Other speakers were C. M. White, vice president in charge of operations, Republic Steel Corp.; Whiting Williams, Cleveland, who discussed employer-employe relationships, and Prof. Russell Weisman, Western Reserve university, Cleveland, who spoke on the business outlook.

The apprentice training committee's report read by Harold S. Falk, Falk Corp., Milwaukee, pointed out that conservative estimates indicate about 7 per cent of industry's skilled men are lost each year as the result of death, superannuation, transfer to other occupations and other causes, and that the best method of replacing them is through apprenticeship training.

The report gave information as to how apprentices may be trained, selected, contract forms, work and wage schedules, and related instruction.

Pittsburgh Area Has Lowest Assembly Cost

■ A survey by the bureau of business research, University of Pittsburgh, indicates the Pittsburgh area remains the low-cost steel center. Blast furnace assembly costs basically determine the location not only of blast furnaces, but also of major steel furnaces and rolling mills, the bureau reports.

Assembly costs per gross ton of pig iron during the summer of 1937 were found to be as follows: Pittsburgh, $6.425; Weirton-Steubenville, $6.313; Cleveland, $6.452; Detroit, $6.832; Youngstown, $7.342, and Chicago, $7.595. Birmingham had a lower cost but this was offset by cost of transporting finished material.

It costs approximately $5.80 to deliver two tons of iron ore to Pittsburgh furnaces, compared with about $3.50 to Chicago. To balance this advantage Pittsburgh gets its coal and coke by river barge at much less cost than fuel can be delivered at Chicago.

MEN OF INDUSTRY

■ CARL C. BROWN, district sales manager at Birmingham, Ala., for Republic Steel Corp. since the merger with Gulf States Steel Co. last year, has been named assistant manager of sales of the wire division, to direct sales activity throughout the South. R. J. Working, district sales manager of Republic at Birmingham prior to the Gulf States

Carl C. Brown

merger, has resumed the district managership.

J. R. Fraine, associated with the Chicago district sales organization of Republic since September, 1935, and a member of the wire division sales staff since May, 1936, has been appointed assistant manager of sales of the wire division for the northern territory with headquarters in Chicago.

♦

Joseph Swersey has recently been promoted to vice president, Segal Safety Razor Corp., division of Segal Lock & Hardware Co. Inc., New York.

♦

E. L. Zehrbach has been elected president, Bluffton Mfg. Co., Findlay, O., maker of washing machines and automatic stokers. He succeeds Albert C. Lora, retired.

♦

E. C. Greenstreet, formerly with Standard Gas Equipment Co., Baltimore, has resigned to become affiliated with the Chicago Vitreous Enamel Product Co., Cicero, Ill.

♦

J. N. Spencer, vice president and general manager, Hobart Mfg. Co., Troy, O., has been elected president and general manager, to succeed the late H. L. Johnson.

♦

Henry A. Roemer, president, Pittsburgh Steel Co., Pittsburgh, and Sharon Steel Corp., Sharon, Pa., has been elected a director of the Alan Wood Steel Co., Conshohocken, Pa., succeeding Scott Stewart.

♦

Clarence W. Krueger has been elected a vice president, Chicago-Latrobe Twist Drill Works, Chicago and Latrobe, Pa., in charge of its newly established Pittsburgh branch at 20 Penn avenue.

♦

S. O. Otrich, S. O. Otrich Co., 119 Montgomery street, San Francisco, factory representative for industrial mechanical equipment, has been appointed representative for Foote Bros. Gear & Machine Corp., covering northern California.

♦

John H. Holzbog, personnel director, Chain Belt Co., Milwaukee, has

R. J. Working

been awarded the Milwaukee junior chamber of commerce distinguished service award, for his services in promoting industrial safety.

♦

J. M. McClure has been elected vice president, and Samuel Sewall, treasurer, Minneapolis Iron Store Co., Minneapolis, succeeding S. L. Sewall, vice president and treasurer, who died Jan. 7. The new treasurer is a son of the late Mr. Sewall.

♦

Frank F. Flaig, associated 36 years with Parkersburg Iron & Steel Co., Parkersburg, W. Va., since 1923 in capacity of general superintendent, has resigned. Mr. Flaig expects to take a few months' rest and plans to go to California.

♦

C. V. Gardner has been appointed district sales manager, Republic Steel Corp., in charge of the Seattle office, succeeding C. D. Winter, resigned. Mr. Gardner has been associated with Republic since 1923, having been in charge of its St. Paul office from 1930 to 1937.

♦

Victor R. Willoughby has been elected to the newly created office of vice president in charge of engineering, American Car & Foundry Co., New York. He has been general mechanical engineer of the company since 1924 and will continue to exercise general supervision over the engineering department.

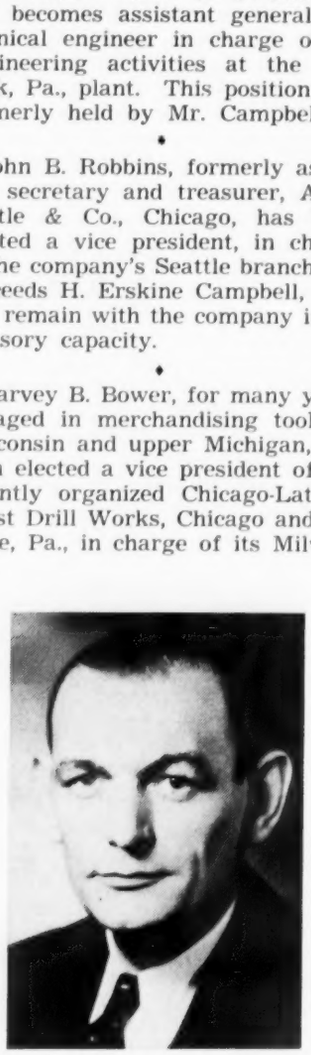
E. D. Campbell succeeds Mr. Willoughby as general mechanical engineer and will make his headquarters in New York. W. F. Dietrichson becomes assistant general mechanical engineer in charge of all engineering activities at the Berwick, Pa., plant. This position was formerly held by Mr. Campbell.

♦

John B. Robbins, formerly assistant secretary and treasurer, A. M. Castle & Co., Chicago, has been elected a vice president, in charge of the company's Seattle branch. He succeeds H. Erskine Campbell, who will remain with the company in an advisory capacity.

♦

Harvey B. Bower, for many years engaged in merchandising tools in Wisconsin and upper Michigan, has been elected a vice president of the recently organized Chicago-Latrobe Twist Drill Works, Chicago and Latrobe, Pa., in charge of its Milwau-



J. R. Fraine

kee branch at 910 North Fourth street.

♦

George J. Haas has been appointed service manager, Stran-Steel division, Great Lakes Steel Corp. The department he will head is a new one devoted to the dissemination of product information to architects, builders, housing groups and lumber dealers. Mr. Haas previously served as assistant project manager

to the United States Housing Authority at the Parkside project in Detroit and the Brand Whitlock homes in Toledo, O.

♦

D. R. Droll has joined the New York district sales office of Wheeling Steel Corp. as sales representative. A graduate of Leland Stanford university, he formerly was with Westinghouse Electric & Mfg. Co., and more recently with Clayton Mark & Co., Chicago.

♦

Phil Huber, president and general manager, Ex-Cell-O Corp., Detroit, has been elected a director, National Machine Tool Builders' association, to fill the vacancy created by the resignation of Newton A. Woodworth, formerly first vice president of the association. W. E. Whipp, president, Monarch Machine Tool Co., Sidney, O., and second vice president of the association, has been elected first vice president, succeeding Mr. Woodworth.

♦

Allen W. Morton has been elected a vice president, Koppers Co., Pittsburgh. He will continue in charge of Koppers' American hammered piston ring division at Baltimore where he has been general manager.

♦

Ross B. Treer has been appointed chief engineer, Logansport Machine Inc., Logansport, Ind., manufacturer of air, hydraulic, solenoid and hand-operated chucks, valves and presses. For the past seven years Mr. Treer

Ross B. Treer

has been chief engineer, Cleveland Punch & Shear Works Co., Cleveland.

♦

N. B. Ornitz, vice president and a director, Blaw-Knox Co., Pittsburgh, has been named president of the company's power piping division. He will also continue management of the National Alloy Steel division of Blaw-Knox. W. N. Quartz has been made vice president in charge of operations, power piping division.

♦

Jerome H. Nymberg, associated with Gar Wood Industries Inc., Detroit, for the past 15 years, has been named manager of the Detroit air conditioning branch of the company to succeed Norman Saylor who is no longer with the company. Prior to his promotion he was manager of installation and service for the air conditioning branch, and Henry W. Jackson has succeeded Mr. Nymberg in this capacity.

♦

Theodore F. Smith, formerly vice president, Oliver Iron & Steel Corp., Pittsburgh, has been appointed executive vice president. Charles Fassinger Sr., vice president in charge of operations, has been made vice president in charge of development and research. Morgan Kavanagh, formerly of Cleveland, has succeed-

Allen W. Morton

ed Mr. Fassinger in the capacity of general plant manager.

♦

Paul P. Hastings will become vice president in charge of traffic, Atchison, Topeka & Santa Fe railroad on March 1. He succeeds Fred B. Houghton who is retiring after 53 years of service with that road. Mr. Hastings has been associated with the Santa Fe since 1891, currently being freight traffic manager.

♦

R. A. Sanguinetti has been appointed western division manager, Timken Roller Bearing Co., Canton, O., and will have charge of sales of industrial, automotive and service bearings, rock bits and fuel injection equipment. He formerly was district manager for the Service Co. on the West Coast, and will retain his office at 1800 Van Ness avenue, San Francisco.

P. T. Ancarrow, formerly head of the Atlanta service branch, has been named Atlanta, Ga., division manager. His headquarters are at 280 Spring street, northwest, Atlanta. B. E. Keifer has been made Cincinnati division manager.

♦

Robert Sergeson has joined the staff of Crucible Steel Co. of America as chief metallurgist of its Park works, Pittsburgh. Graduating from the University of Pennsylvania in chemical engineering, 1922, he started work that year with Central Steel Co., Massillon, O., in the metallurgical laboratory. He continued with that company after its merger with Central Alloy Steel Co. and later with the Republic Steel Corp.,

Robert Sergeson

and for the past eight years served as a director of the metallurgical laboratory for the Canton and Massillon plants.

♦

J. E. Andress, heretofore president, Barnes Drill Co., Rockford, Ill., has been made chairman of the board. Albert M. Johnson, with the company since its organization in 1907 and for the past several years chief engineer, has become president. W. M. Fairbairn, superintendent, has been promoted to first vice president and works manager. Reed M. Andress, purchasing agent, has been advanced to second vice president and foreign sales manager, and A. G. Block is secretary-treasurer.

♦

Dr. Robert E. Doherty, president, Carnegie Institute of Technology, Pittsburgh, has been awarded the 1937 Lamme medal of the American Institute of Electrical Engineers, for his "extension of the theory of alternating current machinery, his skill in introducing that theory into practice, and his encouragement of young men to aspire to excellence in this field." The medal and certificate will be presented to him at the institute's annual summer convention in Washington, June 20-24.

♦

Harry W. Ellis, president and general manager, Johnson Service

Co., Milwaukee, manufacturing temperature controls, has retired to become chairman of the board. He joined the firm 43 years ago. J. A. Cutler, Chicago, vice president and sales manager, has been elected president. C. G. Ward, manager of the Denver office, has been elected a vice president and succeeds Mr. Cutler at Chicago. Kennedy Duff,

G. D. Deabler

Newly elected resident manager at Indianapolis for Austin Co., as noted in STEEL, Jan. 24, page 23. For the past two years Mr. Deabler has represented the Austin Co. in southern Indiana

manager of the eastern district with headquarters in New York, has retired and is succeeded by M. F. Rather.

♦

G. Reed Schreiner, assistant advertising manager, Carnegie-Illinois Steel Corp., Pittsburgh, has been promoted to advertising manager.

G. Reed Schreiner

He succeeds Charles R. Moffatt, recently appointed director of advertising, United States Steel Corp. of Delaware. He entered the advertising department of the former Carnegie Steel Co. in January, 1919.

♦

Prof. William N. Barnard has been named director of the Sibley school of mechanical engineering by the Cornell university board of trustees. A graduate of Cornell, 1897, he has been, with the exception of two brief periods, a member of the faculty ever since. During the past year and a half he has been acting director of the Sibley school.

♦

Moxie S. George, associated with the Milwaukee office of Inland Steel Co. for several years as assistant general sales manager, has been appointed assistant manager of sales for the company's flat rolled steel division in Chicago, effective April 1. Prior to joining Inland, Mr. George was affiliated with the Moise Steel Co., Milwaukee, and with the American Rolling Mill Co., Middletown, O.

Frank K. Culloden has joined Inland's Milwaukee sales staff. He was associated with Inland in 1921 and since that time has been with Carnegie-Illinois Steel Corp. and Bethlehem Steel Co.

DIED:

■ CHARLES W. STONE, 63, consulting engineer, General Electric Co., Schenectady, N. Y., in that city, Feb. 3. He became identified with General Electric in 1900.

♦

John Taylor Martindale, president and treasurer, VanCamp Hardware & Iron Co., Indianapolis, in Miami, Fla., Jan. 14.

♦

Royal T. Hodgkins, 59, associated with the U. S. L. Battery Corp., Niagara Falls, N. Y., at his home in Great Neck, L. I., recently.

♦

Howard R. Bemis, 70, president, Bemis & Call, wrench manufacturers, Springfield, Mass., Feb. 2 at Springfield. He also was treasurer of the Fiberloid Corp., Springfield.

♦

Leo O. Smith, 53, president and treasurer, Columbia Machine Works & Malleable Iron Co., Brooklyn, N. Y., Feb. 8 at his home in Garden City, Long Island.

♦

Eugene R. Carichoff, 77, retired engineer, General Electric Co., Schenectady, N. Y., and winner of the Charles Coffin foundation award for outstanding engineering achievement, in that city, recently. He had been associated with General Electric 23 years, retiring in 1930.

♦

A. George Jake, 47, secretary, Richards Badger Packard Co., Milwaukee, manufacturing and jobbing new and used machinery and tools, in Milwaukee, Feb. 4.

♦

Frank J. McGrail, 65, for the past several years foundry superintendent, Struthers-Wells-Titusville Corp., Titusville, Pa., in that city, Feb. 9. He has held positions as foundry superintendent with the Worthington Pump & Machinery Corp., Harrison, N. J.; Struthers-Wells Corp., Titusville, Pa.; Honolulu Iron Works, Honolulu, T. H.; Westinghouse Air Brake Co., Wilmerding, Pa.; Fairbanks, Morse & Co., Three Rivers, Mich.

Activities of Steel Users, Makers

■ BLAW-KNOX Co. has announced its entrance into production of equipment for electro-tinning of steel and other continuous electroplating processes, through acquisition of Electrochemical Processes Co., Youngstown, O. This will be operated as a division .

J. S. Nachtman, president, Electrochemical company, will be in charge, with offices at Groveton, Pa.,

J. S. Nachtman

postoffice box 1586, Pittsburgh.

Following graduation from Colorado School of Mines, Mr. Nachtman was associated with the American Steel & Wire Co., and E. W. Bliss Co. He then became superintendent in charge of electroplating, Thomas Steel Co., Warren, O.

♦

Bodine Electric Co., Chicago, recently completed a 3500-square foot addition to its plant, to be used for parts inspection, machine operations and engineering laboratories.

♦

Fairbanks-Morse & Co., Chicago, has moved its general offices from 900 South Wabash avenue to the modernized Fairbanks-Morse building at 600 South Michigan avenue.

♦

South Bend Air Products Inc., South Bend, Ind., was organized

(*Please turn to Page* 98)

British Empire's Largest Steelworks To Perpetuate Memory of American

(Special Correspondence)

JAMSHEDPUR, INDIA

■ TATA Iron & Steel Co. Ltd., Jamshedpur, has established a series of memorial lectures to honor Charles Page Perin, the American who was its consulting engineer from the time of its inception to his death, Feb. 16, 1937. The company will have scientists of international reputation come to India to give these lectures.

The first was given Jan. 1 in the city hall here by Sir Henry Tizard, C. B., F. R. S., rector of the Imperial College of Science and Technology, College of London, London, Eng., on the subject, "Industrial Research—Present and Future."

The Tata works, built at a cost of more than $70,000,000, are the largest in the British Empire. They have capacity for producing 600,000 tons of steel and 1,000,000 tons of pig iron annually.

Jamshedpur, built under Mr. Perin's supervision, has 110,000 inhabitants and is one of the few industrial towns in India with modern housing and sanitation, electric lights, filtered water and a large hospital. Mr. Perin also developed in India a charcoal blast furnace, and 100 miles of forest roads for the state of Mysore.

Pays Tribute to Perin

In opening the lecture course, Sir Chunilal Mehta, K. C. S. I., a director in the company, paid tribute to Mr. Perin, and also to J. L. Keenan, former general manager.

"It was in 1902," he said, "that the great founder of Jamshedpur and of the illustrious house of Tatas, visited America. He persuaded Mr. Perin to come out with his partner, C. M. Weld, to examine possibilities of steelworks in this country, to establish which Mr. Tata had made up his mind.

"Thirty years ago this was an absolute jungle, infested with wild animals. The late Mr. Jamshedji Tata spent many years in investigation with Mr. Perin, and spent no less than five lacs of rupees (about $150,000) in the investigation.

"After great effort they located this spot, where fortunately the deposits of iron ore, then recently discovered, were close to coal mines and water. Since then the company has gone on from strength to strength. There have been thin times but it is to great credit of the sons of Mr. Tata as well as to Mr. Perin that the company has not only survived but has gone to this high state of development.

"My own experience of the driving force of Mr. Perin reminds me of an occasion when he came to the board and suggested the purchase of more iron ore properties, and insisted that some of the directors must go with him and see the deposits. It was somewhere about 30 miles away from the railroad. We were taken there and slept in a tent far from human habitations. Although Mr. Perin was not in the best of health, I remember how he walked off his feet in seeing those deposits.

"It was during the difficult times

Charles Page Perin

of the war that his genius and driving power came to light. I remember one occasion when, after interviewing the railroad authorities, he complained bitterly of the manner in which his propositions for expansion, depending on reasonable freight rates and facilities, were dealt with. He got it all back, however, in one particular case. When during the war there was great shortage of wagons (freight cars) for bringing coal to the steelworks, he was asked to provide, or at any rate, to contribute to the capital cost of more wagons. So shrewdly did he design the wagons that they were suitable wholly for our own mines, and for no others.

"It was only Mr. Perin's eloquence that made the board go in for great extensions in 1916. He was shrewd enough to propose to nontechnical members of the board plans which showed excellent promises and profits, but ultimately must also mean expansion of the whole works. Next year there was demand for more money for further extensions.

"I have not the least hesitation in saying that development of these works and the pace at which they took place is in large measure due to the personality of Mr. Perin. I cannot resist paying personal tribute to J. L. Keenan, general manager (an American), who today handed over charge, for the great work he has done in getting so many Indians to be covenanted officers of the company, in so many responsible positions. The best example of this is perhaps the fact that charge of these great works will now for the first time be in the hands of a distinguished officer, Mr. Joe Ghandy." (See STEEL, Jan. 31, page 23.)

Lectures To Perpetuate Memory

In prefacing his lecture, Sir Henry referred to the remarkable achievement of the Tata firm "in developing the works to be the largest in the British empire," standing high as an example of efficiency, leadership and constant endeavor to improve in every direction.

He called attention to the fact that all scientists suffer in a sense, that after the lapse of years their work becomes hidden in the general foundations of scientific knowledge.

"It is possible," he said, "that in 30 years there may be no direct trace in the Tata company of the work of Mr. Perin, but his influence will remain and his memory be perpetuated by the memorial lectures."

Lord Ernest Rutherford, Trinity college, Oxford, England, winner of the Nobel prize in 1908, had been asked to deliver the first lecture but was unable to do so. His death in October, 1937, removed the possibility of a later engagement. He was to have visited India to preside over the Indian Science congress and expected to inspect the Tata works.

Farthest North Blast Furnace Let to Freyn Co.

■ Contract for the farthest north modern blast furnace stack, at Glasgow, Scotland, of 500 tons nominal daily capacity, with auxiliary plant, has been awarded Ashmore, Benson, Pease & Co. Ltd., British associate of Freyn Engineering Co., Chicago.

Colvilles Ltd., owner of Clyde Iron Works, Glasgow, plans two stacks, of which this is the first, to replace two older stacks and increase capacity. The new furnace will be similar in size and general character to the Freyn-design furnace built by the Ashmore company for Ford Motor Co. at Dagenham, near London, in 1930.

Steel for Sale in 1937 Up 4.5%

■ PRODUCTION of steel and iron for sale in 1937 totaled 37,945,108 gross tons, compared with 36,297,284 tons in 1936, according to the American Iron and Steel institute. The figures are compiled from reports of 174 companies, representing practically the entire industry. The total for 1937 represents 70.5 per cent of the ingots produced by these companies. In 1936 the total equaled 67.7 per cent of the ingot production.

Of total steel products for sale in 1937, 2,435,149 tons were for export and 3,708,360 tons were shipped to members of the industry for further conversion into finished products. As a result total steel products produced for sale, less shipments to members of the industry, amounted to 34,236,748 gross tons, representing 72.6 per cent of finishing capacity. In 1936 total products produced for sale less shipments to members of the industry for conversion were 31,184,389 tons or 67.7 per cent of finishing capacity.

In fourth quarter of 1937 production for sale totaled 5,808,173 gross tons which, less shipments to members of the industry for conversion, totaled 5,433,694 gross tons or 46.1 per cent of finishing capacity. This compares with 8,793,285 gross tons or 76.4 per cent of finishing capacity in the corresponding quarter of 1936.

Pig iron produced for sale, including ferromanganese and spiegeleisen, last year totaled 6,542,321 gross tons, of which 1,679,892 tons were shipped to members of the industry for further conversion. Exports amounted to 393,545 tons. In 1936 pig iron produced totaled 5,466,377 tons with 6983 tons exported.

AMERICAN IRON AND STEEL INSTITUTE
Capacity and Production for Sale of Iron and Steel Products

Fourth Quarter - 1937 (Period)

		Number of companies	Items	Annual Capacity Gross tons	Production for Sale—Gross Tons: Current Quarter: Total	Current Quarter: Per cent of capacity	Current Quarter: Shipments: Export	Current Quarter: Shipments: To members of the industry for conversion into further finished products	To Date (12 Months 1937): Total	To Date: Per Cent of capacity	To Date: Shipments: Export	To Date: Shipments: To members of the industry for conversion into further finished products
Steel Products	Ingots, blooms, billets, slabs, sheet bars, etc.	31	1	xxxxxxx	509,877	xxx	99,509	188,216	3,784,978	xxx	342,150	2,164,981
	Heavy structural shapes	9	2	4,739,805	339,811	28.7	19,371	-	2,490,007	52.5	117,723	xxxxxxx
	Steel piling	4	3	264,800	17,305	26.1	1,494	-	106,140	40.1	7,375	xxxxxxx
	Plates—Sheared and Universal	22	4	6,335,219	426,025	26.9	88,421	1,302	3,033,303	47.9	382,172	20,899
	Skelp	7	5	xxxxxxx	59,857	xxx	4,132	35,764	605,192	xxx	72,682	344,444
	Rails—Standard (over 60 lbs.)	4	6	3,575,000	171,162	19.2	60,856	-	1,276,389	35.7	83,961	xxxxxxx
	Light (60 lbs. and under)	7	7	433,500	12,155	11.2	1,003	-	96,130	22.2	12,623	xxxxxxx
	All other (Incl. girder, guard, etc.)	2	8	140,000	2,227	6.4	22	-	38,662	27.6	6,186	xxxxxxx
	Splice bar and tie plates	15	9	1,472,193	28,992	7.9	6,004	-	450,083	30.6	10,778	xxxxxxx
	Bars—Merchant	41	10	xxxxxxx	507,060	xxx	36,298	42,953	3,751,068	xxx	110,804	417,263
	Concrete reinforcing	29	11	xxxxxxx	121,496	xxx	12,367	-	789,946	xxx	35,203	xxxxxxx
	Cold finished—Carbon	18	12	xxxxxxx	90,572	xxx	2,571	-	635,791	xxx	7,981	xxxxxxx
	Alloy—Hot rolled	16	13	xxxxxxx	119,892	xxx	2,513	10,867	710,419	xxx	11,660	56,740
	—Cold finished	13	14	xxxxxxx	18,461	xxx	388	-	90,524	xxx	1,365	xxxxxxx
	Hoops and baling bands	4	15	xxxxxxx	17,503	xxx	164	-	91,942	xxx	1,072	xxxxxxx
	TOTAL BARS	60	16	11,644,953	874,984	30.1	54,301	53,820	6,069,690	52.1	168,085	474,003
	Tool steel bars (rolled and forged)	17	17	106,092	8,252	31.1	62	-	46,359	43.7	180	xxxxxxx
	Pipe and tube—B. W.	16	18	1,808,472	125,200	27.7	4,846	-	778,088	43.0	28,944	xxxxxxx
	L. W.	11	19	1,469,099	105,699	28.8	3,313	-	680,048	46.3	25,042	xxxxxxx
	Electric weld	4	20	588,107	35,824	24.4	2,416	-	198,379	33.7	3,619	xxxxxxx
	Seamless	15	21	2,775,328	347,537	50.1	27,886	-	1,659,582	59.8	101,081	xxxxxxx
	Conduit	7	22	155,270	13,459	34.7	236	-	79,790	51.4	2,420	xxxxxxx
	Mechanical Tubing	5	23	188,800	23,696	50.2	2,589	-	123,282	65.3	7,262	xxxxxxx
	Wire rods	19	24	xxxxxxx	95,582	xxx	13,803	29,058	676,648	xxx	54,762	216,084
	Wire—Drawn	38	25	1,339,827	155,398	41.4	11,733	2,036	1,206,452	63.8	58,713	18,210
	Nails and staples	19	26	1,125,356	65,296	23.2	4,328	-	486,050	43.2	21,809	xxxxxxx
	Barbed wire and fence	17	27	1,181,008	39,200	13.3	5,507	-	369,354	31.3	35,032	xxxxxxx
	Bale ties	11	28	115,277	6,303	21.9	30	-	51,440	44.6	248	xxxxxxx
	All other wire products	5	29	31,000	830	10.7	1	-	6,151	19.8	2	xxxxxxx
	Fence posts	15	30	150,100	9,074	24.2	234	-	62,118	41.4	1,195	xxxxxxx
	Black plate	12	31	572,229	80,911	56.6	5,899	27,144	384,449	67.2	18,985	121,670
	Tin plate	14	32	2,961,812	521,037	70.4	119,612	-	2,462,763	83.2	388,695	xxxxxxx
	Sheets—Hot rolled	19	33	xxxxxxx	244,346	xxx	22,937	1,300	1,886,067	xxx	94,033	36,397
	Hot rolled annealed	21	34	xxxxxxx	282,281	xxx	25,192	105	1,827,020	xxx	87,347	1,416
	Galvanized	16	35	xxxxxxx	197,631	xxx	21,748	-	1,188,368	xxx	81,101	xxxxxxx
	Cold rolled	19	36	xxxxxxx	378,910	xxx	37,137	-	2,030,690	xxx	117,860	xxxxxxx
	All other	16	37	xxxxxxx	84,329	xxx	3,885	-	549,323	xxx	17,419	xxxxxxx
	TOTAL SHEETS	29	38	10,157,327	1,187,497	46.8	110,899	1,405	7,481,468	73.7	397,760	37,813
	Strip—Hot rolled	28	39	3,475,674	338,263	38.9	11,585	35,684	2,108,034	60.7	60,300	310,256
	Cold rolled	39	40	1,200,333	108,845	36.3	1,838	-	729,267	60.8	9,126	xxxxxxx
	Wheels (car, rolled steel)	5	41	380,319	22,855	24.0	741	-	168,144	44.2	2,499	xxxxxxx
	Axles	5	42	425,900	25,438	23.9	10,901	-	137,525	32.3	12,392	xxxxxxx
	Track spikes	11	43	308,458	8,618	11.2	78	-	92,524	30.0	1,125	xxxxxxx
	All other	6	44	27,907	964	13.8	112	-	6,619	23.7	223	xxxxxxx
	TOTAL STEEL PRODUCTS	149	45	xxxxxxx	5,808,173	xxx	673,767	374,479	37,945,108	xxx	2,435,149	3,708,360
	Estimated total steel finishing capacity based on a yield from ingots of 70.5%	-	46	47,190,500	xxxxxxx	46.1	xxxxx	xxxxxxx	xxxxxxx	72.6	xxxxxxx	xxxxxxx
	Pig iron, ferro manganese and spiegel	31	47	xxxxxxx	1,441,280	xxx	102,013	247,031	6,542,321	xxx	393,545	1,679,892
	Ingot moulds	4	48	xxxxxxx	50,394	xxx	941	-	377,495	xxx	5,387	xxxxxxx
Iron Products	Bars	13	49	237,019	4,953	8.4	24	79	55,115	23.3	184	874
	Pipe and tubes	4	50	185,457	6,017	13.0	150	-	48,223	26.0	810	xxxxxxx
	All other	4	51	113,660	1,508	5.3	-	166	15,554	13.7	1,985	2,130
	TOTAL IRON PRODUCTS (ITEMS 49 to 51)	16	52	478,176	12,478	10.4	174	245	118,892	24.9	2,979	3,004

Total Companies Included - 174

Total steel products produced for sale, less shipments to members of the industry for conversion into further finished products Current quarter 5,433,694 *G.T.;* 46.1 *% of Finishing Capacity.*
To date 34,236,748 *G.T.;* 72.6 *% of Finishing Capacity.*
The above tonnages represent 70.5 *% of the ingots produced by companies whose products are included above.*

MEETINGS

A. S. M. E. ARRANGES DETAILS OF WEST COAST MEETING

■ A program embracing topics of primary interest is being arranged by the American Society of Mechanical Engineers for its national spring meeting at the Biltmore hotel, Los Angeles, March 23-25. Sessions for the three-day meeting will deal with aeronautics, applied mechanics, fuels, machine shop practice, hydraulics, petroleum, power, and related subjects.

Although the society will conduct its own meeting program, it is one of the co-operating national technical societies sponsoring the Western Metal congress and exposition in Los Angeles, March 21-25. Sessions of the Metal congress also will be at the Biltmore hotel, while the exposition will be in the Pan-Pacific auditorium.

In connection with its meeting, the American Society of Mechanical Engineers is arranging an organized tour from New York, St. Louis, Chicago and Kansas City to Los Angeles by rail and return to New York by water via Acapulco, Mex., the Panama canal and Havana. The trip will require four weeks and members of the American Society for Metals, American Welding Society, and others attending the western congress and show are invited to participate.

"FOREIGN TRADE WEEK" IS SET FOR MAY 22-28

"National Foreign Trade Week," sponsored by the Chamber of Commerce of the United States, will be observed May 22-28 with appropriate meetings.

More than 1000 trade associations and local organizations observed the week in 1937. The object is to direct attention to foreign trade and stimulate local surveys and development of foreign trade possibilities.

A. S. T. E. TO REBATE SHOW PROFIT TO ITS MEMBERS

American Society of Tool Engineers will turn over to its 14 chapters the proceeds of the Machine and Tool Progress exhibition at Convention Hall, Detroit, March 9-12, this money to be used as mileage rebates for members attending the show and the society's first annual convention.

The show is staged primarily for benefit of society members, although it will be open to all members of the industry. It is stated that society members will be responsible for many million dollars worth of new equipment purchases in 1938. Membership in the society consists largely of production executives responsible for the purchase, selection, design or supervision of operation of machines, tools, and production equipment in mass production industries. Chapters are in the northeastern and Mid-western parts of the United States.

Success of the exhibition already is assured. Reservations for space exceed anticipation and it has been necessary to make more floor area available. Exhibitors now total over 100. A high percentage of the exhibits will feature machinery, tools and related equipment in operation.

INDUSTRIAL GAS EXPERTS TO MEET IN PITTSBURGH

Annual industrial gas sales conference of the Industrial Gas section, American Gas association, is to be held at William Penn hotel, Pittsburgh, March 7-8. Hale A. Clark, Detroit City Gas Co., Detroit, is chairman of the section.

Among papers scheduled for presentation are: "Immersion Heating Capitalizes Advantages of Gas for Soft Metal Melting," by Elmer B. Dunkak, vice president, C. M. Kemp Mfg. Co., Baltimore; "Improvements in Crucible Melting With Gas," by Ralph D. Hawkins, Bridgeport Gas Light Co., Bridgeport, Conn., chairman, nonferrous metals committee, and Oliver D. Pritchard, Brooklyn Union Gas Co., Brooklyn, N. Y.; "A Discussion of Up-to-Date Gas Forging Practices," by M. W. Martin, Public Service Co. of Indiana, Indianapolis; "Heating Galvanizing Pots with Convection Gas Heat."

Gradual Pickup Seen In Foundry Equipment

■ H. S. Hersey, vice president, C. O. Bartlett & Snow Co., Cleveland, was elected president of the Foundry Equipment Manufacturers association at its annual meeting, Cleveland hotel, Cleveland, Feb. 8. He succeeds R. S. Hammond.

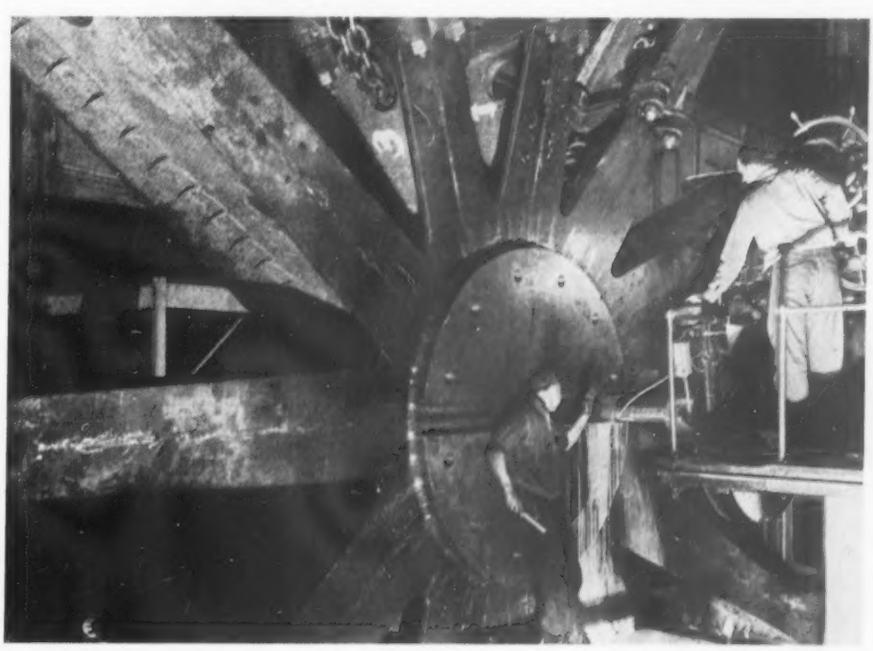
P. J. Potter, vice president, Pangborn Corp., Hagerstown, Md., was elected vice president. Arthur J. Tuscany, Penton building, Cleveland, continues as secretary-treasurer.

New directors are: H. S. Simpson. National Engineering Co., Chicago; O. C. Sabin, Steel Blast Abrasive Co., Cleveland; and Mr. Potter.

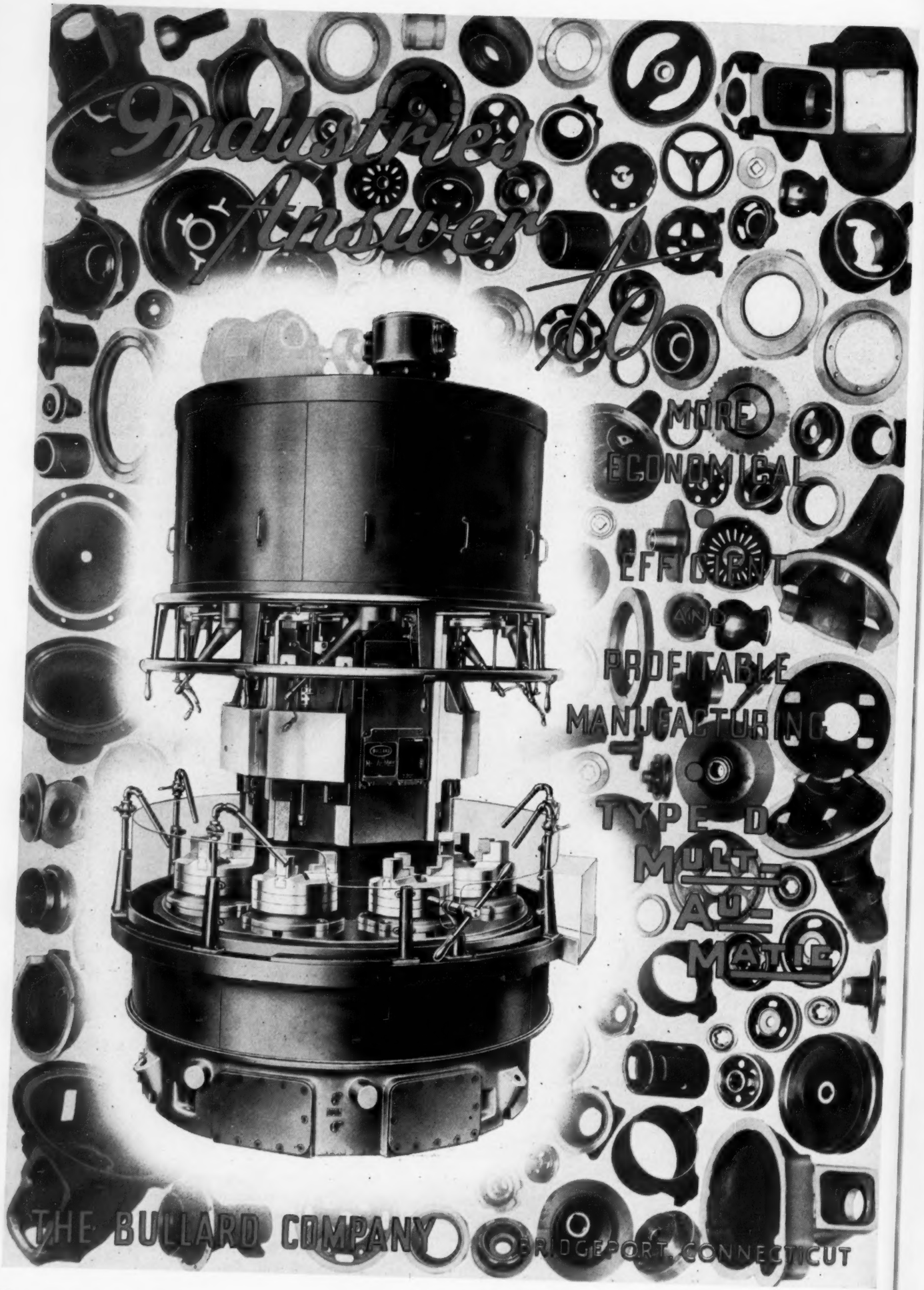
Prospects in the equipment industry are for a gradual improvement, most of those attending indicated.

Speakers included C. E. Hoyt, executive vice president, American Foundrymen's association; Lewis M. Lind, chief machinery division, United States department of commerce, bureau of foreign and domestic commerce; Albert E. Grover, cost consultant, Cleveland; and Dan M. Avey, secretary-treasurer, American Foundrymen's association, Chicago.

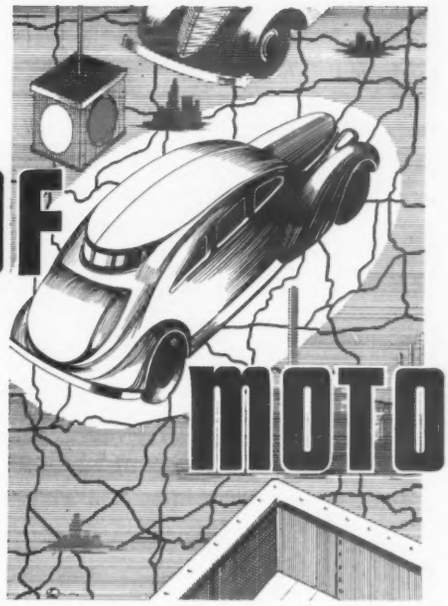
Steel To Harness Waters at TVA Dam



■ **These heavy spider-legs of steel are part of a rotor for a waterwheel generator for the Tennessee Valley Authority's Pickwick landing dam. The spider weighs 45 tons and its overall diameter is 26 feet. Complete generator will be 44 feet in diameter and will generate 40,000 kilovolt amperes, or about 54,000 electrical horsepower. It is being built in the East Pittsburgh works, Westinghouse Electric & Mfg. Co.**


Industries Answer
MORE
ECONOMICAL
EFFICIENT
AND
PROFITABLE
MANUFACTURING
WITH
TYPE D
MULT-
AU-
MATIC
THE BULLARD COMPANY
BRIDGEPORT, CONNECTICUT

MIRRORS OF MOTORDOM



DETROIT

■ PACKARD'S slicing of $100 from the list price of all models in the 6-cylinder line may be the opening gun in the industry's carefully planned campaign to revive car buying. The reduction amounts to 8½ per cent on the four-door sedan model, ranging upward to 12 per cent on the chassis.

News of the move was fed painstakingly into the proper publicity channels to have the maximum effect from the standpoint of generating good feeling for the company for its effort to stimulate production, perhaps even more than from the angle of bringing in new customers. When enough time has elapsed to weigh the full results of the price cut, it is possible other producers may follow suit.

Sloan Appraises Cut

General Motors' Mr. Sloan appraised Packard's move as more of an adjustment to meet competition than a reduction in price level, which, of course, is good reasoning because news of price cuts by one producer immediately raises the question in the minds of prospective buyers about what other producers are contemplating in the way of prices.

It appeared something had to be done to reduce the spread between new car prices which currently are some 10 per cent above last year's level and used car prices which in some districts are at the lowest point since 1931—the latter a natural outgrowth of excessive stocks. Furthermore it is reasonable to assume that when new car prices were boosted last year (twice, in fact), producers were cognizant of the fact 1938 was going to be a poor year, and thus saw in the price increases a cushion to fall back upon as a last resort to giving some impetus to buying this year.

Favorable angles of the market at present include a perceptible reduction in used car stocks, reported from numerous sections of the country; affirming of used car prices, with upward movement a matter of weeks; and approach of seasonable weather which will reawaken the urge to buy a new car or make a change in cars. Instances are heard of prospective purchasers of new cars being offered from $50 to $100 more for their present cars than in December. A survey of conditions in Wayne county, Michigan, reveals dealer stocks of used cars only 20 per cent higher than the average for this time of the year.

Time, naturally, is the most important factor in relieving used car congestion, and manufacturers have become resigned to the situation to the extent they are not attempting to overload dealers with used cars,

BY A. H. ALLEN
Detroit Editor, STEEL

Testing Forged Steel Camshaft

■ **Checking a forged steel camshaft for alignment and hardness in the Pontiac plant, Pontiac, Mich., after it has been machined, heat treated and ground. The surface gage at the left of the base on which the shaft is supported provides an accurate measurement of alignment or straightness, while the scleroscope hardness indicator being manipulated by the operator gives a nondestructive test of the hardness of cam surfaces**

and are basing production schedules on orders received. Result has been that the industry is operating on the basis of a 3,000,000-car year instead of a 5,000,000-car year, and employment has suffered seriously. But it is felt in many quarters that by April 1 conditions may be improved appreciably, and the automobile industry may be able once more to lead the way out of the recession woods.

■ REASONING on the theory that you cannot stop a toboggan slide half way down, many observers in this area are of the opinion the soundest policy possible now would be to reduce prices of cars, reduce prices of steel and other materials, trim wages proportionately — in other words level off to a firm plateau from which upward ascent may be resumed.

This contention was further borne out last week with announcement of $4 per ton reduction in price of cold-rolled sheets—$2 per ton in base price and $2 in waiving of the oiling extra. This covers the bulk of material used in bodies and effects a reduction of about 6 per cent.

The extra charge for oiling this grade of sheets has been the basis for numerous arguments and complaints on the part of buyers who specify "dry" sheets to avoid the charge, and then reject material when rust spots develop in damp weather. With the $2 extra waived, there can be no further complaints on this score.

As far as inventories are concerned, the reduction in price should not cause too much difficulty. Chevrolet, for example, is reported to have sufficient supply of sheets to carry through until March 15 at the present rate of production, but only five days' supply at capacity production. Fisher Body supplies are on a comparable basis. Neither of these interests has made any important steel purchases since last October; thus some good sheet tonnage should be appearing in the next month or so. Buick's recent buy of sheet tonnage probably will not carry beyond the end of March, as it is hoped to double present assembly schedules for March.

■ GLOOMY picture presented by Chrysler assemblies in the past few weeks has brightened encouragingly. Plymouth will assemble about 14,000 cars this month and has made releases of material and parts accordingly. For March, Plymouth schedules call for 20,000, and for April 40,000. The latter figure represents about 80 per cent of capacity.

Dodge likewise has moved up assembly schedules for spring—7000 for February, 11,000 for March and 20,000 for April. Naturally, these totals are subject to overnight revision, but that is how the picture looks at the moment.

Now that it is past history, some of the details can be told of the Plymouth redesign which early in January had almost reached the assembly line, but which at the last minute was killed. In addition to a revised front end treatment, the changes called for installation of stainless steel molding strips along the belt line, and a new finish on interior moldings. Bodies had all been drilled for snapping on the molding, tools and dies had been purchased by the supplier of the molding, and after the sudden cancellation of the program, the body builder had to recall a force of men to solder up the holes and refinish the surfaces. Cost of returning the bodies to their former style is estimated at $30 each, although it is not known how many bodies were involved.

Garnish moldings on the interior of the Plymouth have been changed, a wood grain finish replacing the former plain, painted finish. They are supplied by Motor Products here, which holds the license to use a special graining process required by this finish. At one time it was planned to manufacture these moldings eventually in the new Briggs plant at the city limits, and the change undoubtedly will have some effect on operations in this new plant.

Appearance of the first national advertising on the new Hudson 112 indicates dealers throughout the country have been fairly well stocked with the new model, although assemblies are still going ahead at a rate of about 2000 per week. With some 3600 outlets to be supplied with the new model, the plan was followed of shipping the first of the new cars to the most remote dealers and gradually working back toward Detroit, which accounts for the fact some local showrooms have only recently received the 112 model for display.

Number of new Hudson dealers signed up in January was 30 per cent ahead of the comparable figure in December, and additions are still being made. Meanwhile, the plant continues to release against material and parts orders placed several months ago when production of the 112 was started.

Ford closed Friday for a one-day inventory. It appears likely there will be some slowing down in schedules at Ford, since dealers are well stocked and production has been holding steadily at the 20,000 weekly rate for practically two months.

■ BOOM in the aviation industry, as a result of heavy governmental expenditures, has had its effect among a number of companies in this territory which supply parts for aircraft. Aircraft engine departments of Continental Motors Inc., for example, have been working on a full 5½-day week, with occasional overtime. Orders and shipments in this division have reached an alltime high. The same is true of the Battle Creek, Mich., division of Eaton Mfg. Co., where valves are made for aircraft, diesel and industrial engines. This company also has built up a good volume of business at its Massillon, O., division where between 50,000 and 60,000 refillable seltzer bottles of a new type are being manufactured monthly.

Some of the local tool and die shops are finding themselves in an unfavorable position because of investment in jobs which have been completed for automobile producers but which have not been released for delivery. Such work represents needs for current production by auto companies, it is said, but because of the restricted volume of assemblies, delivery has been held up. A small shop, with considerable investment already made in material and labor, is at a considerable disadvantage if many of these "hold-ups" are on their floors.

One of the large rubber companies is reported to be supplying experimental rubber fenders for use on trucks manufactured by an important builder in the commercial car field.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

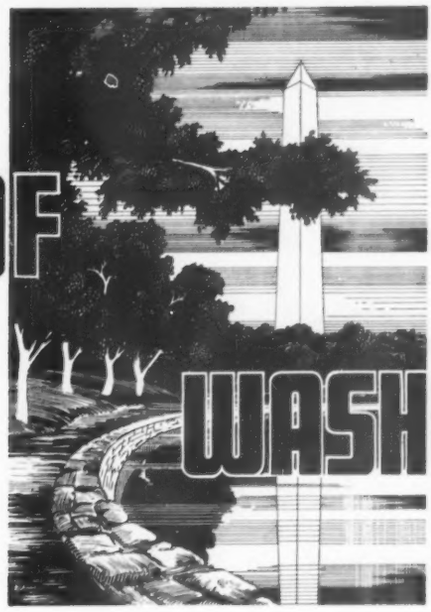
	1936	1937	1938
Jan.	377,244	399,634	*250,000
Feb.	300,810	383,698	.....
March	438,943	519,177	.....
April	527,625	553,415	.....
May	480,518	540,357	.....
June	469,368	521,139	.....
July	451,206	456,909	.....
Aug.	275,934	405,064	.....
Sept.	139,820	175,620	.....
Oct.	230,049	337,979	.....
Nov.	405,799	376,637	.....
Dec.	518,958	346,886	.....
Year	4,616,274	5,016,565	.....

*Preliminary.

Week ended	
Jan. 15	65,735
Jan. 22	65,418
Jan. 29	59,365
Feb. 5	51,443
Feb. 12	57,810

	Week ended Feb. 12	Feb. 5
General Motors	20,950	21,230
Chrysler	9,050	2,950
Ford	20,760	20,700
All others	7,050	6,563

WINDOWS OF WASHINGTON



BY L. M. LAMM

Washington Editor, STEEL

WASHINGTON

■ AFTER ALL the promises made by the President and members of congress to business and industry that tax relief would be quickly forthcoming all that has developed so far is a fight in the ways and means committee of the house, which is drafting the new bill.

The principal argument is over what are termed the close corporations. Republican members of the committee feel strongly on the subject and it has been claimed that enough Democratic members of the committee feel the same way to swing the vote.

Last week the President had to enter the picture in an effort to bring some harmony among the majority party members, but it is not yet clear whether the result has been attained.

About the middle of January members of the ways and means committee told newsmen that by early in February the bill would be reported to the house.

Senate Will Rewrite Bill

Representative Doughton, chairman of the committee, told the writer late last week that he believed that sometime this week or certainly early next week the bill would be reported to the house. He has participated in the close corporation fight and should know whether it is nearly over.

Some Washington observers who have been following tax matters in great detail for years say that it will be mid-March before the bill even passes the house. Which is interesting, because there has been some talk in the house that congress might adjourn by that time.

At any rate, one thing is sure, that when the bill reaches the senate, no matter how it passes the house, the finance committee will rewrite it. The story in confidential circles is that the senate feels it should be much more lenient to business than the house is apparently going to be, but the senate dare not go too far. However, there is every indication that it will really be a long time before the tax bill is finally passed and receives the signature of the President.

Representative Celler of New York last week in a speech on the tax situation characterized the report of the Vinson subcommittee of the ways and means committee of the house as one of the most complicated and technical tax reports that has ever been made to the house, and declared business could find no word of cheer or encouragement in the new bill. While he gave credit to the subcommittee for granting some relief, he said that business will still merely receive "four lashes instead of ten."

He insisted that the report was based largely on recommendations of treasury experts and pointed out how far these experts had missed the mark in previous predictions.

"Frankly," said Celler, "my faith has been greatly shaken in the efficiency of the predictions made by the treasury department. For example, they claimed that the undistributed profits tax would prevent depressions. I believe it is the attitude of congress now to fashion its own taxation policy on the score of once bitten twice shy."

END OF WAR PROFITS SEEN IN TWO BILLS

Both houses of congress are advancing bills which would ban profits in time of war. Under the contemplated legislation the President would become a virtual dictator and special tax provisions are contained in one measure.

President Roosevelt some time ago made suggestions to congress regarding national defense, including one to ban profiteering during war.

The house committee on military affairs has already approved a bill and it is expectetd to reach the floor of the house soon. All indications point to its passage.

Another measure has been before the senate finance committee and it is reported there is a proposal to tack it on to the revenue bill when it reaches the senate from the house.

The bill pending in the finance committee was introduced by Senataor Connally, Texas, and would impose a graduated scale of individual income and undivided corporation profit taxes in the event of war. There are no tax provisions in the bill referred to above as pending in the house.

Those who have been watching these two bills closest insist that under either the Chief Executive would become a virtual dictator of commerce and industry in time of war. There is every indication these bills will be passed during the present session of congress.

SOME WAGE-HOUR BILL SEEMS CERTAIN TO PASS

There was considerable agitation last week in connection with the wage-hour bill. It seems that it is impossible to kill this particular bill, not only because the President has publicly stated that he wants and expects some kind of a bill at this session, but there are also many supporters of the idea on capitol hill.

Representative Norton, New Jersey, who was chairwoman of the house labor committee, had a conference with Mr. Roosevelt last week and told the newspaper correspondents the President still favors the enactment of a wage-hour bill at this session, but that he is willing to leave details entirely to con-

gress. It is agreed by house members that the bill will have to be drastically changed from the form presented to the house at the last session, when it was defeated. Also Mrs. Norton has stated publicly that she will not attempt again to force consideration of this legislation over the opposition of the house rules committee.

The National Association of Manufacturers is urging on the house the enactment of the so-called Clarke-Connery child labor bill, which the senate passed in modified form at the special session, as a rider on the wage-hour bill.

PIG IRON, SCRAP EXPORTS CALLED WAR MATERIAL

Representative Martin, Massachusetts, made a speech in the house last week in connection with foreign trade, with especial reference to government statements and trade agreements.

He contended that recent figures made public by the government showing a favorable trade balance of some $261,000,000, compared with $33,000,000 in 1936, was not a fair comparison.

He claimed that increased exports of war materials for the last few years, especially 1937, are all that have saved the administration's face in its reciprocal trade policy. Exports of war materials showed some increases in 1935 and 1936. They were largest in 1937, amounting to over $776,000,000, and showed definitely that this country would have had no favorable balance of trade without them, but on the contrary would have had an adverse balance of about $250,000,000.

A careful examination of exports for 1937, he stated, discloses that war supplies alone amounted to $776,000,000. Even this figure does not include the whole list of war supplies, he contended, but only the outstanding items such as pig iron, iron and steel scrap, steel ingots, etc.

He quoted figures showing exports of a good many steel products from 1932 to 1937. Included in these he showed that in 1932, 227,522 tons of iron and steel scrap were exported, valued at $1,859,000, while in 1937 these exports increased to 4,039,143 tons valued at $76,380,820. He called attention also to the fact that in 1932 the United States exported 2324 tons of pig iron valued at $54,000, while in 1937 this export had risen to 782,436 tons valued at $19,403,285. He gave figures for other steel exports along the same lines.

Mr. Martin told the house that under the most-favored-nation clause of reciprocal trade treaties, the administration is opening wide the doors of the American market to cheap foreign manufactured products. "We cannot forget," he said, "and it cannot be too strongly stressed, that those commodities which are non-competitive with American industry are on the free list under the tariff act. The simple truth is that every reduction of tariff duties on items included in the numerous reciprocal trade treaties means reduction of the tariff on the commodity that is competitive with the American producer."

SCRAP EXPORT HEARINGS ARE SET FOR MARCH 8

Senator Thomas, Utah, chairman of the subcommittee of the senate military affairs committee having charge of bills dealing with prohibition of scrap exports except under government license, announced last Friday he will begin hearings March 8. Senator Thomas made a report Feb. 10 to the full military affairs committee on his recent executive hearing on essential metals and was instructed by the committee to proceed with the open hearings. He stated that in addition to the question of scrap exports he will hear all those who want to discuss essential metals.

WOULD CURB PRESIDENT IN FOREIGN TRADE PACTS

Representative Treadway, Massachusetts, has introduced a bill in the house (HR 9339) to limit the President's authority in proclaiming modifications of existing tariff duties in connection with foreign trade agreements and to provide for the submission of such agreements to congress for approval.

The bill has been referred to the ways and means committee of the house, of which Mr. Treadway is the ranking Republican member. Of course, there is no chance of any action on this bill, because it would upset the present system used by the new deal administration. In calling upon the President to submit his trade agreements to congress, the bill provides that "no foreign trade agreement entered into by the President after the enactment of this act, and no renewal or extension of any previously existing foreign trade agreement, shall become effective until it shall have been approved by current resolution of the congress."

WAR LABOR REGULATION IS STRONGLY OPPOSED

John Brophy, of the CIO, is much concerned over the Sheppard-Hill bill, introduced in the house a short time ago, which would place labor under rigid military control in the event of war. He seems to approve some of the bills which would place industry strictly under government supervision during war, but does not feel that labor should be so treated.

"This bill," Mr. Brophy states in a letter to CIO affiliates, "is the most recent of many attempts that have been made to subject the free American labor movement to a fascist regime in the event of a war. The bill pretends merely to regulate production and prevent war profiteering. Its true nature, however, is scarcely concealed, since this bill gives the President full power to fix the price and compensation of services, to control industrial organizations, and to fix the conditions under which any business may be operated * * * Under the provisions of this bill the President would fix the wages and other conditions of employment, but any attempt on the part of workers to ask for higher wages or shorter hours would be subjected to the penalties provided in the pending bill."

LITTLE NRA BILL OPPOSED

The National Association of Manufacturers has referred to the Borah-O'Mahoney bill as "a device broader even than the NRA for bringing small business in the nation under the domination of a federal bureau."

It appears that industry is just awakening to the seriousness of this legislation. The association last week made public reference to this bill in which it stated, "we believe its extreme nature (the bill), its severity, the unlimited discretion conferred upon an administrative agency, it duplication of existing laws and agencies, its conflicts of jurisdiction with the states, and its procedural and administrative difficulties, are sufficient to condemn it as unsound and unwise policy even though it were not, as we believe it to be, invalid as a matter of law. Furthermore, the serious advocacy of measures like this does much to stimulate the unwholesome feeling of business uncertainty."

SEEK STEADY TIN SUPPLY

The foreign affairs committee of the house last week held a hearing on H. R. 9154, which is the McReynolds bill to provide for co-operation between the United States and foreign nations producing tin ore and other materials, to assure to this country continuing supplies of tin to supplement deficient domestic resources and production of that metal.

Henry H. Butman, a metal expert, was the only witness heard. He had previously made some special reports for the committee on tin. He took up for the benefit of the committee the present tin situation both in the United States and abroad, giving some attention to the international tin cartel. He reviewed also the situation of the United States during the World war and told the committee of the tin situation in this country as of the present.

Drastic Regimentation of all Industry Threatened in Federal License Bill

■ ON SEVERAL occasions STEEL has pointed out that the Borah-O'Mahoney bill, now before congress, is one of the most sinister measures ever introduced.

It would provide for federal control of business through compulsory licensing. It is a device broader even than the national industrial recovery act for bringing every small business in the country under domination of a federal bureau. Of great interest to all industry, therefore, is a report on this bill by the National Association of Manufacturers. The association's findings, in part, are as follows:

"The bill is presented as a means for regulating corporations. But the term corporation, as defined in the bill, includes not only companies big and little but any joint venture or other unincorporated venture. Since the term joint venture refers to a group action, the term unincorporated venture refers also to individual action. The bill covers not only industrial ventures but agricultural as well, including cooperatives and even individual farmers where they compete with licensees.

All-Inclusive Control by Trade Commission Makes it a Czar

"Thus this measure would bring federal control of the business acts of any individual, of any isolated shop, in any isolated town in the country. It would reach every type of business enterprise. . . . It would provide stringent penalties to enforce the discretionary will of the great federal bureaucracy that would be necessary for administration. Drastic powers of investigation and inquiry, together with the power of publicizing the intimate and confidential affairs of all persons engaged in commerce would be conferred on the federal commission.

"One of the most serious aspects of this proposal is that it imposes control upon control. The federal trade commission would be given powers in fields already occupied by all the states, and would be given a dual and conflicting jurisdiction with the national labor relations board, the securities and exchange commission and similar agencies of state governments. It undertakes also to deal with corporate surpluses and the distribution of dividends, a subject already covered by federal tax laws.

Heavy Penalties for Trivial Infractions of License Terms

"The penalties of the proposed measure are more drastic than occur in any other federal statute. They range all the way from substantial fines to imprisonment and to absolute exile from commerce. Under this bill any person required to operate under a license, who engaged in a single act without a license, would be an outlaw. The bill furthermore permits an administrative agency to revoke a license and thus put the licensee out of business for the most trivial violations of the terms of his license."

It is clear that every effort should be expended to protect American industry and commerce from the sort of regimentation the pernicious Borah-O'Mahoney bill would impose.

At the same time it must be apparent to all that some sort of revision of the laws governing business in this country is in the making. Surely industrial and business leaders should be able to register their needs as effectively as farmer and labor spokesmen. It is not enough to oppose the Borah-O'Mahoney bill. Rather, the emphasis should be for laws wisely conceived and administered. Happily this viewpoint has gained wide acceptance, and it is hoped that present constructive efforts in this direction will be intensified.

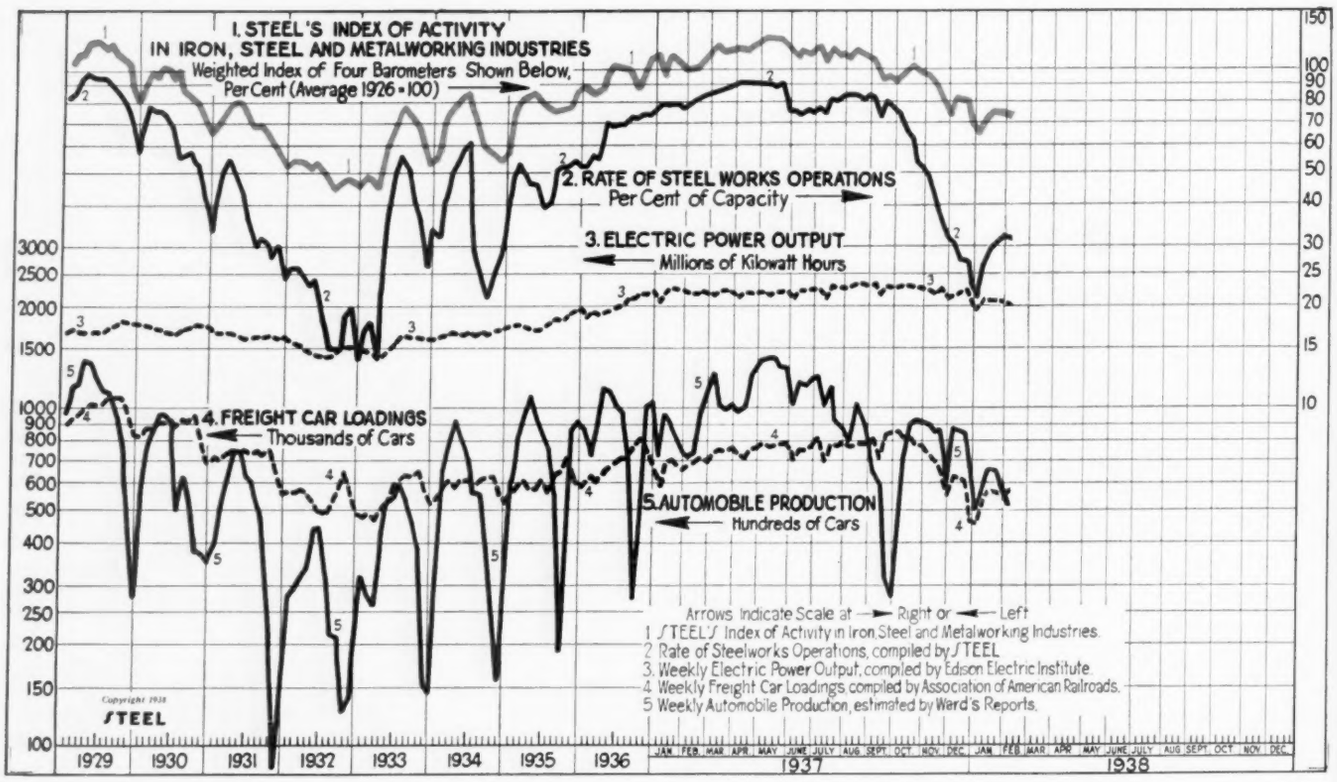
Rate of Industrial Activity Drifts to Lower Levels

■ Moderate losses in three of the four barometers caused a decline in STEEL's index of activity in the iron, steel and metal working industries to 71.0 for the week ending Feb. 5. This compares with 73.8 in the preceding week, and 74.7 for the week ending Jan. 22, highest in the upward movement since the turn of the year.

The net recovery of 8.3 points to date, from the low of 62.7 on Jan. 1, falls short of restoring the index to the level of 79.4 in the week ending Dec. 18—the last week of 1937 unaffected by holiday interruptions.

Slight recession in STEEL'S index for the week ending Feb. 5 was due largely to a decline of 2 points in steelworks operations. This was the first decline in the steelworks operating rate since the low of 21 per cent on Jan. 1, from which point this important barometer rose steadily to 33 per cent in the week ending Jan. 29.

A sidewise movement in activity, with few and slight fluctuations except of seasonal character is indicated for the remainder of the month.


1. STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
Weighted Index of Four Barometers Shown Below,
Per Cent (Average 1926 = 100)
2. RATE OF STEEL WORKS OPERATIONS
Per Cent of Capacity
3. ELECTRIC POWER OUTPUT
Millions of Kilowatt Hours
4. FREIGHT CAR LOADINGS
Thousands of Cars
5. AUTOMOBILE PRODUCTION
Hundreds of Cars
Arrows Indicate Scale at → Right or ← Left
1 STEEL'S Index of Activity in Iron, Steel and Metalworking Industries.
2 Rate of Steelworks Operations, compiled by STEEL.
3 Weekly Electric Power Output, compiled by Edison Electric Institute.
4 Weekly Freight Car Loadings, compiled by Association of American Railroads.
5 Weekly Automobile Production, estimated by Ward's Reports.
Copyright 1938 STEEL
1929 1930 1931 1932 1933 1934 1935 1936
1937
1938

STEEL'S index of activity declined 2.8 points to 71.0 in the week ending Feb. 5:

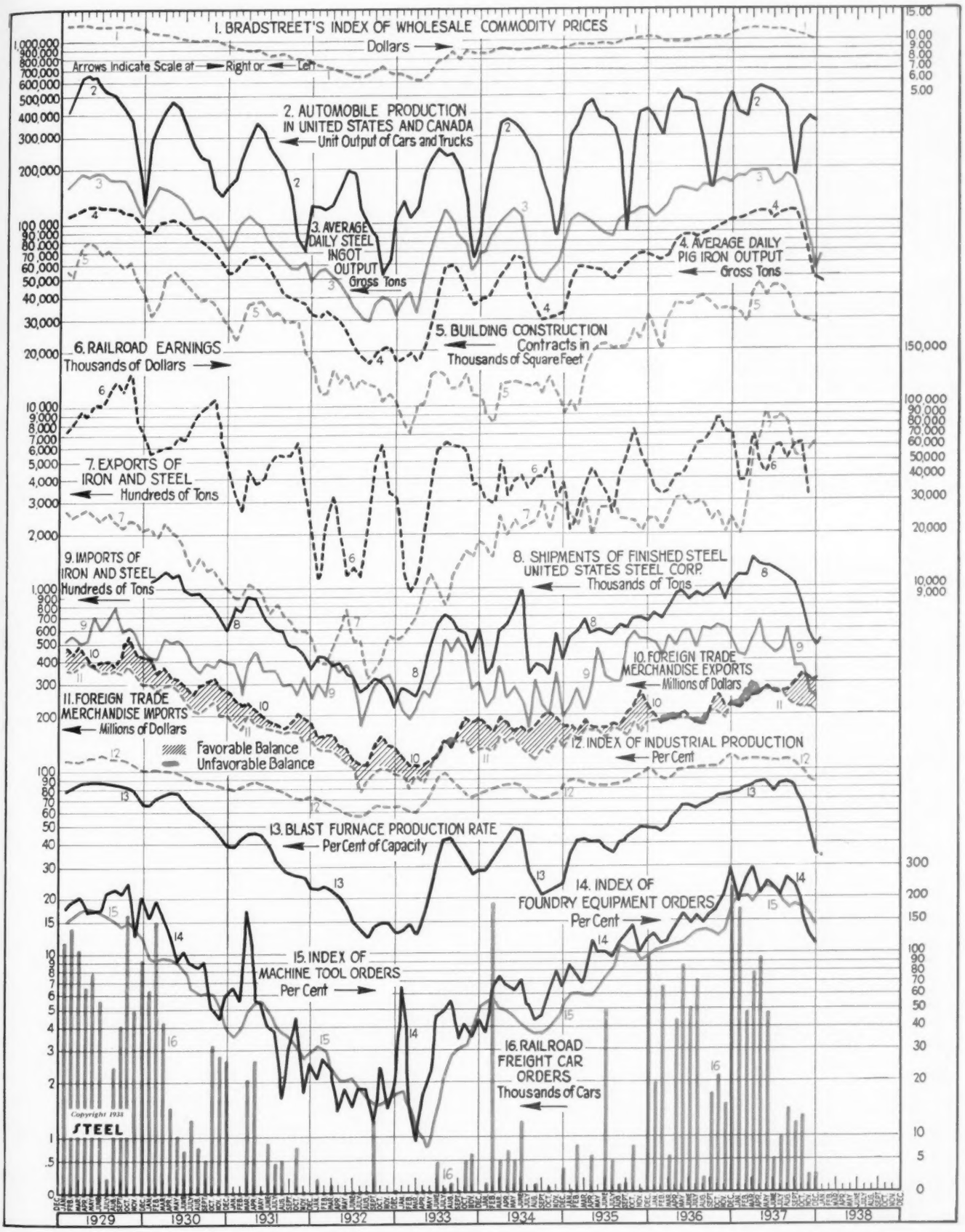
Week ending	STEEL's Index of Activity Index No.		Steelworks Operating Rate Per Cent		Electric Power Output Million KWH		Freight Car Loadings		Weekly Auto Output	
	1937	1936	1937	1936	1937	1936	1937	1936	1937	1936
Nov. 6	92.3	102.1	47.0	73.0	2,202	2,169	732,145	759,318	89,770	84,305
Nov. 13	86.5	107.9	39.0	74.0	2,176	2,169	689,614	784,672	85,325	104,248
Nov. 20	84.9	109.9	35.0	74.5	2,224	2,196	647,251	790,500	85,757	110,160
Nov. 27	72.7	105.2	31.5	75.5	2,065	2,133	558,627	679,984	58,955	104,283
Dec. 4	81.5	108.4	30.5	76.5	2,152	2,243	623,337	744,957	86,173	100,395
Dec. 11	80.5	113.9	27.0	77.5	2,196	2,278	622,131	738,747	85,765	119,455
Dec. 18	79.4	114.8	27.0	79.5	2,202	2,274	603,292	729,696	82,025	121,038
Dec. 25	69.5	93.3	23.0	68.0	2,085	2,080	460,367	562,218	67,230	79,019
	1938	1937	1938	1937	1938	1937	1938	1937	1938	1937
Jan. 1	62.7	96.6	21.0	79.0	1,998	2,069	457,359	587,953	49,550	71,800
Jan. 8	70.1	107.8	26.0	79.5	2,139	2,244	552,314	698,529	54,084	96,780
Jan. 15	74.4	106.7	29.0	79.0	2,115	2,264	580,600	700,238	65,735	91,685
Jan. 22	74.7	104.0	30.5	80.0	2,108	2,256	570,333	670,376	65,418	81,395
Jan. 29	73.8†	99.6	33.0	76.0	2,098	2,214	553,176†	659,790	59,365	74,148
Feb. 5	71.0*	100.8	31.0	79.5	2,082	2,201	569,771*	675,026	51,443	72,295

*Preliminary. †Revised.

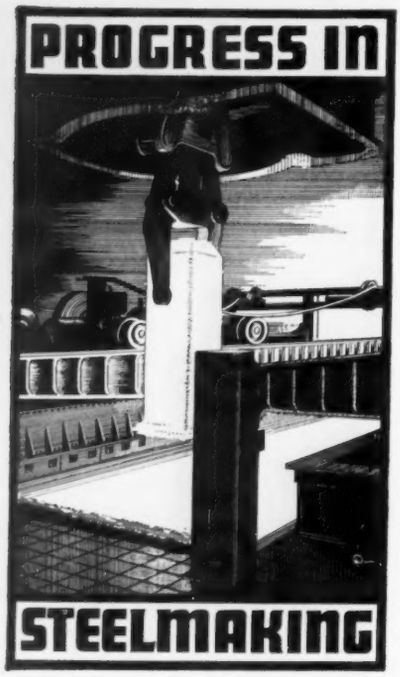
STREND

Key:	Dec. 1937	Key:	Dec. 1937	Key:	Dec. 1937	Key:	Dec. 1937
1	$9.77	5	28,718,400	9	25,792	13	34.2†
2	346,886	6	$32,440,920*	10	$319,756,000	14	111.2
3	66,626†	7	626,418	11	$208,863,000	15	140.8
4	46,426†	8	518,322†	12	84	16	275

*November. †January.



Key: 1. Bradstreets' Index (Average of Wholesale Commodity Prices. 2. Automobile Production in United States and Canada, compiled by U. S. Department of Commerce. 3. Average Daily Steel Ingot Output, compiled by American Iron and Steel Institute. 4. Average Daily Pig Iron Output, compiled by STEEL. 5. Building Construction, Contract Awards in 37 States, compiled by F. W. Dodge Corp. 6. Railroad Earnings, Net Operating Income for Class I Roads, compiled by Bureau of Railroad Economics. 7 and 9. Iron and Steel Foreign Trade, reported by Bureau of Foreign and Domestic Commerce. 8. Shipments of Finished Steel, United States Steel Corp. 10 and 11. Foreign Trade, Value of Exports and Imports, reported by Bureau of Foreign and Domestic Commerce. 12. Index of Industrial Production (adjusted for seasonal variation; average 1923-25=100) computed by Federal Reserve Board. 13. Blast Furnace Production Rate, compiled by STEEL. 14. Index of Foundry Equipment Orders (Average 1922-24=100), compiled by American Foundry Equipment association. 15. Index of Machine Tool Orders (Three-month moving average; average monthly shipments 1926=100), compiled by National Machine Tool Builders association. 16. Railroad Freight Car Orders, compiled by STEEL.



Annealing Cold Strip

Time and temperature cycles for the heat treatment of cold reduced strip steel and sheets and various phases of deoxidizing practice involve close operating control

By T. N. KEELAN

■ Annealing practice setups on cold-reduced stock in continuous mills is a matter of concern to the operating and technical forces to insure a uniform and satisfactory product. Considerable experimentation often is required to arrive at the proper practices if the rigid requirements of surface finish and drawing qualities are met.

While there is little or no disagreement at various continuous mills in the annealing specifications for surface or physical properties (Rockwell and Olsen values), nevertheless the annealing setups are found to vary considerably from mill to mill. This is attributed to differences at the mills in the vital factors that mitigate for or against the development of proper grain structures, physicals or surface finishes.

From the standpoint of surface requirements out of the anneal, cold-reduced stock is usually produced in three grades—deoxidized, black and steam blue.

As far as the drawing qualities (physical values and grain structure) specified, the annealing setups usually differentiate between forming, deep drawing and extra deep drawing stocks.

Two distinct phases of some of the setups in use at continuous cold mills follow:

1. Heat treatment (time and temperature cycles) which governs the physical values and grain structure.
2. Deoxidation, steaming, etc. practice which controls the surface finish.

I. Heat Treatment

In some of the following time and temperature cycles, certain mills base their practice solely on the type, grade, gage and form of steel; the amount of reduction; and the charged weight. However, the increasing demands for higher and more uniform drawing qualities, investigational and experimental work indicated to other mills that many other variables in processing had to be controlled to insure satisfactory results, especially on deep-drawing or extra deep-drawing stock.

A survey of the following setups will show that if control is exercised

Chart I—Curves showing the various pressures of gas used for purging the charge

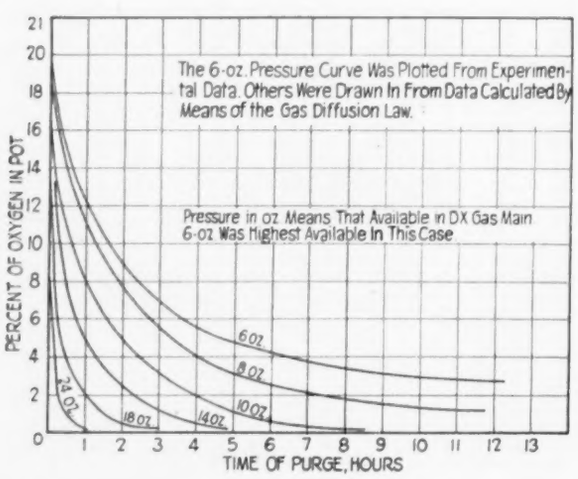
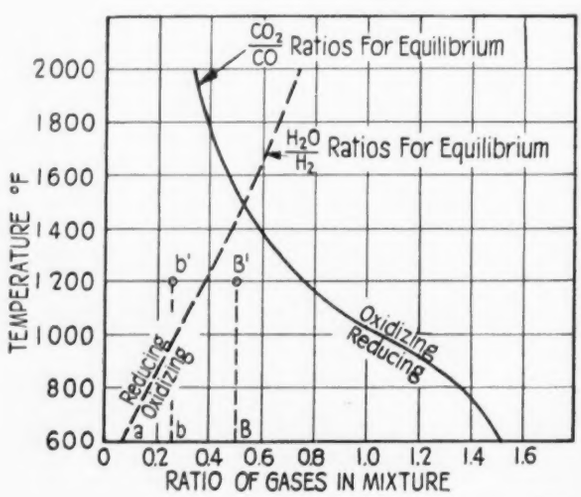

The 6-oz. Pressure Curve Was Plotted From Experimental Data. Others Were Drawn In From Data Calculated By Means of the Gas Diffusion Law.
Pressure in oz. Means That Available in DX Gas Main 6-oz. Was Highest Available In This Case
PERCENT OF OXYGEN IN POT
TIME OF PURGE, HOURS
6 OZ.
18 OZ.
24 OZ.
18 OZ.
14 OZ.
10 OZ.

Chart II—Ratios for equilibrium, taken from the work of A. G. Hotchkiss



at all stages of processing prior to annealing, simplified and standardized cycles can be adopted. Such control will insure delivery to the anneal of uniform stock that will react and respond efficiently to a definite time and temperature setup based largely on charged weights.

Under such circumstances, standard practices for cold-reduced orders have been setup as follows:

A. *Steel Specifications*—standardized as to steelmaking, type, analysis, amount of discard, etc.

B. *Hot Mill Practice*—standardized as to rolling, finishing and/or coiling practice and temperatures.

C. *Tandem Mill or Cold Reducing Practice*—standardized as to percentage of reduction, roll finish (dull, semidull or bright), reduction medium (oil, water, etc.)

Emphasis placed on these variables varies at different plants depending on the flexibility of the mills and equipment but the time and temperatures are synchronized and standardized to the practices established.

Strip Mill "A"

(Widths up to 24 Inches)

1. *Steel:*
   Type: rimmed.
   Analysis: 0.08 per cent carbon maximum.
   Discard: varies with the severity of the draw.
2. *Hot Mill Practice:*
   Rolling, Finishing and Coiling — Not specified as to temperatures. Coilers 150 feet from last stand.
3. *Tandem Practice:*
   Band gages: 0.125 to 0.100-inch.
   Reduction: 41 to 71 per cent.
   Roll Finish: Bright, heavy and semidull.
4. *Annealing Equipment:* Box-type furnaces, bottom fired, one box to the charge. Furnace couples located in front and rear midway from top to bottom in corners are used.
   Charged weights—Coils piled two or more high weigh from 11,000 to 13,000 pounds; flats from 20,000 to 30,000 pounds.

HEAT TREATING CYCLES, MILL "A"

A. Coils: 63 per cent and higher reduction, single anneal, semidull or bright finish, not rewound:
   Firing: bring to 1450 degrees Fahr. furnace temperature and hold 3 hours for semidull finish. Bring to 1400 degrees Fahr. furnace temperature and hold 4 hours for bright finish.
   Soak: at 1320 degrees Fahr. furnace temperature for 20 or 21 hours.

B. Coils: less than 63 per cent reduction, single anneal, bright or semidull finish, not rewound:
   Firing: same as foregoing treatment.
   Soak: at 1300 degrees Fahr. furnace temperature for 21 hours.

C. Coils: 0.037-inch gage, extra deep drawing, intermediate anneal, bright or semidull finish, not rewound:

(First anneal on 0.054 to 0.050-inch reduced from 0.105-inch band)

   Firing: bring to and hold to 1400 degrees Fahr. furnace temperature for 4 hours.
   Soak: at 1280 degrees Fahr. furnace temperature for 12 hours.

(Second anneal on 0.037-inch gage reduced from 0.054-inch bright or semidull finish—not rewound)

   Firing: bring to 1400 degrees Fahr. furnace temperature and hold 4 hrs.
   Soak: at 1280 degrees Fahr. furnace temperature for 12 hours.

D. Coils: 0.031-inch gage—intermediate anneal—bright or semidull finish—not rewound:

(First anneal on 0.054 to 0.050-inch reduced from 0.105-inch band)

   Firing: bring to and hold at 1400 degrees Fahr. furnace temperature for 4 hours.
   Soak: at 1280 degrees Fahr. furnace temperature for 9 hours.

(Second anneal on 0.031-inch reduced from 0.054-inch band)

   Firing and Soak: same as first anneal given under "D."

E. Sheets: 63 per cent reduction or over-bright or semidull finish:
   Firing: bring to and hold at 1420 degrees furnace temperature for 4 hrs.
   Soak: at 1320 degrees Fahr. furnace temperature for 20 hours, if not scrubbed. Soak at 1280 degrees Fahr. furnace temperature for 20 hours, if scrubbed.

F. Sheets: special reduction (28 to 30 per cent) for certain draws.

(On 0.125-inch gage)

   Firing: bring to and hold at 1450 degrees Fahr. furnace temperature for 3 hours.
   Soak: at 1320 degrees Fahr. furnace temperature for 21 hours.

(Lighter than 0.125-inch gage)

   Firing: same as "F" for 0.125-inch gage.
   Soak: 21 hours at 1340 degrees Fahr. furnace temperature.

G. Coils: tin plate gages, bright finish, rewound:
   Firing: bring to and hold at 1300 degrees Fahr. furnace temperature for 4 hours.
   Soak: at 1150 degrees Fahr. furnace temperature from 10 to 12 hours.

Strip Mill "B"

(Widths up to 43 Inches)

1. *Steel:*
   Type: rimmed.
   Analysis: 0.08 per cent carbon maximum.
   Discard: all drawing jobs 20 per cent crop; others cropped to clean steel.
2. *Hot Mill Practice:*
   Rolling, Finishing and Coiling: Not specified as to temperature. Reels 50 feet from last stand.
3. *Tandem Practice:*
   Band Gages and Reductions:

Hot mill band, inches	Finishing gage, inches
0.068	0.031 and under
0.072	0.037
0.078	0.043 to 0.040
0.083	0.050

   Roll Finishes: heavy dull, semidull; and bright.
4. *Annealing Equipment:*
   Box and Tube Type Furnaces: pan weights, flats, 80,000 pounds maximum and 50,000 normal; coils 15,000 single and 30,000 double. Box furnaces are bottom-fired on one side only, in which annealing is done by furnace temperatures only from thermocouples located at the front and rear in the corners opposite the burners and midway from

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Table I

Time and Temperature Cycles, Mill "B"

(Box-Type Furnace Charges)

A. COILS—BRIGHT FINISH, PURGED, TIGHTLY REWOUND

Gage, inches	Firing Practice, degrees Fahr.	Soaking Practice degrees Fahr.	Coils piled
0.0125-0.015	Bring furnace to 1125 in 12 hours	1125 furnace for 30 hours	1-high
0.0125-0.015	Bring furnace to 1125 in 12 hours	1125 furnace for 40 hours	2-high
0.015-0.016	Bring furnace to 1150 in 12 hours	1150 furnace for 40 hours	2-high
0.0175-0.020	Bring furnace to 1175 in 12 hours	1175 furnace for 40 hours	2-high
0.020-0.023	Bring furnace to 1200 in 12 hours	1200 furnace for 40 hours	2-high

B. COILS—BRIGHT FINISH, PURGED, NOT REWOUND

0.025-0.030	Bring furnace to 1300 in 12 hours	1300 furnace for 28 hours	1-high
0.025-0.030	Bring furnace to 1300 in 12 hours	1300 furnace for 38 hours	2-high
0.031 and over	Bring furnace to 1325 in 12 hours	1325 furnace for 38 hours	2-high
0.037 and over (E.D.D.†)	Bring furnace to 1335 in 12 hours	1335 furnace for 38 hours	2-high
0.037 and over (E.D.D.†) reannealed for "hard"	Bring furnace to 1350 in 12 hours	1350 furnace for 28 hours	1-high
0.037 and over (E.D.D.†) reannealed for "hard"	Bring furnace to 1350 in 12 hours	1350 furnace for 38 hours	2-high

C. COILS—NOT PURGED, SEMIDULL OR BRIGHT FINISH, NOT REWOUND

0.025 to 0.030	Bring furnace to and hold 1450 for 4 hours	at 1300 furnace for 28 hours	1-high
0.031 and above	Bring furnace to and hold 1500 for 4 hours	at 1325 furnace for 28 hours	1-high

D. SHEETS—PURGED, DULL FINISH, D. D.* or E. D. D.†

0.020-0.030	Bring to 1240 furnace in 12 hours	at 1240 furnace for 60 hours
0.031 and over	Bring to 1260 furnace in 12 hours	at 1260 furnace for 60 hours
0.031 and over (E. D. D.†)	Bring to 1280 furnace in 12 hours	at 1280 furnace for 60 hours

E. SHEETS—PURGED—BRIGHT FINISH—SCRUBBED—D.D.* or E.D.D.†

0.025 to 0.031	Bring to 1125 furnace in 12 hours	at 1125 furnace for 60 hours at 1125 furnace for 48 hours	on E.D.D.† on D.D.*
0.031 and over	Bring to 1150 furnace in 12 hours	at 1125 furnace for 48 hours	on D.D.*

F. SHEETS—D. D.*—NORMALIZED, NOT PICKLED,—ALSO E. D. D.†

under 0.025	Bring to 1300 furnace and hold 4 hours	at 1100 furnace for 20 hours at 1125 furnace for 26 hours	on D.D.* on E.D.D.†
0.025 and over	Bring to 1300 furnace and hold 4 hours	at 1125 furnace for 20 hours	on E.D.D.†

G. SHEETS—E. D. D.†—NORMALIZED, PICKLED, SCRUBBED AND DRIED

Under 0.025	Bring to 1300 furnace and hold 4 hours	at 1100 furnace for 32 to 44 hours
0.025 and over	Bring to 1300 furnace and hold 4 hours	at 1125 furnace for 32 to 44 hours

*Deep drawing stock.
†Extra deep drawing stock.

the top and bottom of the furnace. The tube furnaces are standard in construction. Annealing is done by control of inside pot thermocouples as well as furnace thermocouples. The interior pot couples are located top and bottom of the charge. The furnace couples are standard units. The time and temperature cycles at this mill are shown in Table I.

Radiant Tube Furnace Charges

Annealing is done by the combination of inside pot and furnace temperatures. Inside thermocouples are placed at the top and bottom of the front and rear ends of the charges. The inside firing and soaking temperatures are 25 degrees Fahr. less on coils and 20 degrees Fahr. less on sheets than the furnace temperatures given under the box-type furnace setups in Table I. Pan weights are 250,000 pounds maximum for sheets and 60,000 pounds for standard coils piled 2-high.

A. Coils: on practically all grades cited in Table I with inside firing and soaking temperatures (steel) being considered 25 degrees Fahr. less than furnace temperatures given in this table.

Firing: bring furnace to 1500 degrees Fahr. furnace temperature as soon as possible and hold it there until the inside steel temperature reaches 50 degrees Fahr. under the proper soaking temperature. Then bring the furnace temperature back to the proper soaking temperature and allow the steel to drift into a soak.

Soak: at proper inside steel temperature (25 degrees Fahr. lower than the furnace temperature given in Table I) for 6 hours on 1-high coil charges and 10 hours on 2-inch charges.

B. Coils: tin plate gages, cleaned, scrubbed and dried:

Firing: bring furnace to 1300 degrees Fahr. furnace temperature at once. Hold it there until the inside steel (top) temperature reaches 1050 degrees Fahr., then reduce the furnace temperature to 1100 degrees Fahr. and let the steel drift into a soak.

Soak: at 1100 degrees Fahr. inside steel temperature for 6 hours on 1-high coils. Soak at 1100 degrees Fahr. inside steel temperature for 10 hours on 2-high coils.

C. Sheets: on practically all grades as listed in Table I with inside firing and soaking temperatures computed as 20 degrees Fahr. lower than furnace temperatures given in the table:

Firing: bring furnace temperature to 1440 degrees Fahr. at once. Hold there until inside steel temperature (top) reaches 50 degrees Fahr. under the proper steel soaking temperature, then reduce the furnace temperature to the proper soaking temperature and allow the steel charge to drift into a soak.

Soak: at the proper inside steel temperature (20 degrees Fahr. lower than the furnace temperature given in Table I) for 20 hours on deep drawing grades and 25 hours on extra deep drawing charges.

D. Sheets: tin plate and lacquer plate, cleaned, scrubbed, dried but not deoxidized:

Firing: bring furnace to 1300 degrees Fahr. furnace temperature immediately. Hold it there 1 hour, reduce to 1250 degrees Fahr. furnace temperature for 2 hours, then to 1200 degrees Fahr. furnace temperature for 2 hours, then to 1150 degrees Fahr. furnace temperature or 1125 degrees Fahr. furnace temp.

Soak: 95 pounds and over—at 1150 degrees Fahr. furnace temperature for 35 hours. Soak 90 pounds and under—at 1125 degrees Fahr. furnace temperature for 35 hours.

Table II

Annealing Practice for Box and Tube-Type Charges

A† SHEETS, DEEP DRAWING; INSIDE TEMPERATURES 1310 DEGREES TOP, 1290 DEGREES BOTTOM

Pan weights, lbs. (000 omitted)	Firing practice,* hours	Soaking practice, hours	Total time, hours
Up to 160 ..	45	15	60
161-170	48	16	64
171-180	51	17	68
181-190	54	18	72
191-200	57	19	76

Add 3 hours to the firing time and 1 hour to the soaking time for each additional 10,000 pounds when computing the cycle for heavier charges, thus:

291-300	87	29	116

B.† SHEETS, NOT DEEP DRAWING SUCH AS STRETCHER LEVELED; INSIDE TEMPERATURES 1310 DEGREES TOP, 1290 DEGREES BOTTOM

Up to 160 ..	34	11	45
161-170	35	12	47

Add 1 hour to the firing time and 1 hour to the soaking time for every additional 10,000 pounds when computing the cycles for heavier charges, thus:

191-200	38	15	53

C.† SHEETS, EXTRA DEEP DRAWING SUCH AS FRONT FENDER STOCK; INSIDE TEMPERATURES 1310 DEGREES TOP, 1290 DEGREES BOTTOM

Up to 160 ..	56	19	75
161-170	60	20	80
171-180	64	21	85

Add 4 hours to the firing time and 1 hour to the soaking time for every additional 10,000 pounds when computing cycles for heavier charges, thus:

291-300	112	36	148

D. SHEETS, ROOFING STOCK, GALVANIZED; INSIDE TEMPERATURE 1225 DEGREES TOP, 1200 DEGREES BOTTOM

Up to 160 ..	34	11	45
161 to 170 ..	36	12	48

Add 2 hours to firing time and 1 hour to soaking time for every additional 10,000 pounds when computing cycles for heavier charges.

231 to 240 ..	50	19	69

E. SHEETS, LIGHT REDUCTION AS 0.043 to 0.031 INCH; TEMPERATURE 1150 DEGREES TOP, 1100 DEGREES BOTTOM. TO BE REDUCTION ROLLED AFTER THE ANNEAL FOR HIGH ROCKWELL VALUE

Any Weight . As fast as possible . 10 ..

F. COILS, 0.025-INCH AND HEAVIER, DEEP DRAWING AND EXTRA DEEP DRAWING; INSIDE TEMPERATURE 1410 DEGREES TOP, 1380 DEGREES BOTTOM

Up to 60 ..	19	6	25
61 to 70 ...	23	7	30

Add 4 hours to the firing time and 1 hour to the soaking time for each additional 10,000 pounds when calculating for heavier charges, thus:

191 to 200 ..	75	20	95

G. COILS, LIGHTER THAN 0.025-INCH; TEMPERATURE 1340 DEGREES TOP, 1300 DEGREES BOTTOM

Up to 60 ...	15	5	20
61 to 70	18	6	24

Add 3 hours to the firing time and 1 hour to the soaking time for each additional 10,000 pounds when computing cycles for a heavier charge, thus:

171 to 180 ..	51	17	68

H. COILS, FLAT JOBS; TEMPERATURE 1340 DEGREES TOP, 1300 DEGREES BOTTOM

Up to 60 ...	12	4	16
61 to 70	14	5	19

Add 2 hours to the firing time and 1 hour to the soaking time for each additional 10,000 pounds when computing heavier charges, thus:

171 to 180 ..	36	16	52

*Time required to bring the charge to the desired temperature.

†Cycles A, B, and C in this table apply to sheet stock 59 inches and less in width. When the width is 60 inches and over, the extra width is compensated for by applying the firing and soaking time allotted for the next highest pan weight, that is:

CYCLE "A" FOR SHEETS, DEEP DRAWING

Pan weights, lbs. (000 omitted)	Firing time, hours	Soaking time, hours	Total time, hours
Up to 160 ..	48	16	64
161-170	51	17	68

CYCLE "B" FOR SHEETS, NOT DEEP DRAWING

Up to 160 ..	35	12	47

CYCLE "C" FOR SHEETS, EXTRA DEEP DRAWING

Up to 160 ..	60	20	80
161-170	64	21	85

Strip Mill "C"
(Widths up to 42 Inches)

1. *Steel:*
   Type: rimmed.
   Analysis: 0.08 per cent carbon, maximum.
   Discard: 50 per cent crop on special extra deep drawing stock. Discard 20 per cent crop on all other grades.
2. *Hot Mill Practices:*
   a. Rolling temperatures: not specified.
   b. Finishing practice: controlled as follows:

Stock	Finishing temp.	Finishing practice
Autobody	1580°	water sprayed
Other cold mill products, 0.109-inch gage and over	1580°	water sprayed
Other cold mill products, 0.109-inch gage and lighter		normal water sprayed

   c. Coiling practice: coiled direct on reels, 100 feet from last stand.
3. *Cold Reducing Practices:*
   a. Band gages: autobody orders, 0.062 to 0.125-inch; other cold mill orders, 0.062 to 0.165-inch.
   b. Per cent reduction: autobody stock, 58 to 70 per cent; other orders, 25 to 70 per cent.
   c. Roll finish: heavy, medium and bright.
4. *Annealing Equipment:* Plant is equipped with box and tube-type furnaces. Annealing is controlled by the use of inside pot temperatures in both types of furnaces. Charging weights vary from 50,000 to 200,000 pounds.

ANNEALING CYCLES, MILL "C"

(Box-type Furnace Charges)

1. *Extra Deep Drawing Sheets:* Autobody, dull:
   Firing: push inside top temperature to 1310 degrees Fahr. and hold there until the bottom inside temperature reaches 1280 degrees Fahr. minimum.
   Soak: at 1310 degrees top and 1280 degrees Fahr. bottom for 30 hours, cut furnace dead, damper and furnace soak 6 hours.
2. *Deep Drawing Sheets:* not autobody, dull:
   Firing: push inside top temperature to 1280 degrees Fahr., hold top there until bottom inside temperature reaches 1240 degrees Fahr. minimum.
   Soak: 18 hours at 1280 degrees top and 1240 degrees Fahr. bottom.
3. *Deep Drawing Sheets:* not autobody, bright:
   Firing: push inside top temperature to 1200 degrees Fahr., hold top there until bottom inside temperature reaches 1150 degrees Fahr. minimum.
   Soak: 18 hours at 1200 degrees top and 1150 degrees Fahr. bottom.

4. *Sheets:* galvanized, etc., bright:
Firing: push inside top temperature to 1250 degrees Fahr., reduce furnace temperature to 1150 degrees Fahr. top inside and hold there until bottom inside temperature registers 1100 degrees Fahr.
Soak: 24 hours at 1150 degrees top and 1100 degrees Fahr. bottom, cut furnace dead, damper and furnace soak 6 hours.

5. *Extra Deep Drawing and Deep Drawing Coils:* autobody, dull:
Firing: push inside top temperature to 1410 degrees Fahr., hold there until bottom inside temperature is 1380 degrees Fahr.
Soak: for 7 hours minimum at 1410 degrees top and 1380 degrees Fahr. bottom inside temperature on 1-high coils.

6. *Deep Drawing Coils:* not autobody, bright, rewound:
Firing: push inside top temperature to 1360 degrees Fahr., hold there until bottom inside temperature is 1320 degrees Fahr.
Soak: for 8 hours minimum at 1360 degrees top and 1320 degrees Fahr. bottom inside temperature on 1-high coils.

7. *Deep Drawing Coils:* not autobody, bright, not rewound:
Firing: push inside top temperature to 1340 degrees Fahr., hold there until inside bottom temperature reaches 1300 degrees Fahr.
Soak: for 8 hours minimum at 1340 degrees top and 1300 degrees bottom inside temperature on 1-high coils.

ANNEALING CYCLES, MILL "C"

(Tube Type Furnace Charges)

1. *Extra Deep Drawing Sheets:* autobody, dull finish:
Firing: bring inside top temperature to 1310 degrees Fahr., hold there until inside bottom temperature reaches 1260 degrees Fahr. or over.
Soak: for 22 hours minimum at 1310 degrees top and 1280 degrees Fahr. minimum bottom.

2. *Deep Drawing Sheets:* not autobody, dull finish:
Firing: push inside top temperature to 1310 degrees Fahr., hold there until inside bottom temperature reaches 1260 degrees Fahr.
Soak: for 18 hours minimum at 1310 degrees top and 1260 degrees Fahr. bottom.

3. *Deep Drawing Sheets:* light-gage tin plate and galvanized, bright finish:
Firing: push inside top temperature to 1150 degrees Fahr., hold there until inside bottom temperature reaches 1100 degrees Fahr.
Soak: for 24 hours minimum at 1150 degrees top and 1100 degrees Fahr. bottom.

STRIP MILL "D"
(Widths up to 90 Inches)

At this mill the annealing cycles are standardized in a more logical manner and the setups follow:

1. *Steel:* rimmed on deep drawing and extra deep drawing stock, 0.08 per cent carbon maximum. Duplexed steel on forming and flat jobs, 0.08 per cent carbon maximum. A 16 per cent discard is taken on standard grades and 36 per cent on extra deep drawing stock.

2. *Hot Mill Practice:* rolling temperatures controlled. Finishing temperatures are not specified but the control of rolling temperatures insures a high finishing temperature. All material is water sprayed. Coils are held from 15 to 45 minutes on the runout table before reeling on the coilers which are located about 300 feet from the last finishing stand.

3. *Tandem or Cold Reducing Practice:*
Reduction: mill set-up on a 60 per cent reduction basis.
Roll Finish: medium to heavy dull.

4. *Annealing Equipment:* Box and tube-type furnaces. Box types are bottom-fired on both sides; tube type are standard. Annealing is based on the inside thermocouple temperatures. Charged weights vary from 60,000 to 300,000 pounds.

Annealing practices for box or tube-type charges are presented in Table II.

A comparative review of the foregoing heat treating cycles can best be made by a recapitulation of the pertinent phases of the standard processing in use on extra deep drawing stock at the various mills. This is shown in Table III. An examination of this table reveals that the most notable differences in these annealing cycles are as follows:

BOX FURNACES

1. Mills A and B anneal by furnace temperatures and mills C and D by steel temperatures.

2. Practice of mill A calls for fast firing while mills B, C and D use slow firing of varying degrees.

3. Mills A and B use lower firing and soaking temperatures than mills C and D.

4. Mills A, B and C give lower tonnages per hour than mill D.

TUBE FURNACES

1. Mill B uses lower temperatures than mills C and D.
2. Tonnage per hour greater on tube

Table III

Standard Heat Treating Cycles

(Extra Deep Drawing Stock)

	Mill "A"	Mill "B"	Mill "C"	Mill "D"
STEEL				
Type	Rimmed	Rimmed	Rimmed	Rimmed
Carbon, per cent	0.08	0.08	0.08	0.08
Discard, per cent	20	20	50	36
HOT MILL PRACTICE:				
Rolling temperature	Uncontrolled	Uncontrolled	Uncontrolled	Controlled
Finishing temperature	Uncontrolled	Uncontrolled	Controlled	Uncontrolled
Coiling temperature	Uncontrolled	Uncontrolled	Water spray, nearly black	Water spray black
COLD MILL PRACTICE:				
Reduction, per cent	63	49	60	60
Finish	Medium dull	Medium dull	Medium dull	Medium dull
A. SHEETS, BOX FURNACE PRACTICES:				
Charged weight, lbs.	25,000	50,000	100,000	180,000
Firing time & temp. hrs. and deg. Fahr.	4-1420	12 to 1280	44 to 1310 top and 1280 bottom	64 to 1310 top and 1290 bottom
Soaking time & temp. hrs. and deg. Fahr.	20-1320	60 at 1280	30 at above temp.	64 at above temp.
Total time, hrs.	24	72	74	85
Output, tons/hr.	0.52	0.35	0.67	1.0
B. COILS, BOX FURNACE PRACTICES:				
	2-high	2-high	1-high	2-high
Charged weight, lbs.	13,000	30,000	30,000	96,000
Firing time & temp., hrs. & deg. Fahr.	4-1400	12 to 1335 (fce.)	25 to 1410 top and 1380 bottom	35 to 1410 top and 1380 bottom
Soaking time & temp. hrs. & deg. Fahr.	21-1320	38 at 1335	7 at above temp.	10 at above temp.
Total time, hrs.	25	50	32	45
Output, tons/hr.	0.26	0.30	0.47	1.0
C. SHEETS, TUBE-TYPE FURNACE PRACTICES:				
Charged weight, lbs.	.....	150,000	150,000	150,000
Firing time & Temp. hrs. & deg. Fahr.	.....	40 to 1260 top and 1240 bottom	45 to 1310 top and 1280 bottom	56 to 1310 top and 1290 bottom
Soaking time & temp. hrs. & deg. Fahr.	.....	25 hrs at above temp.	22 hrs at above temp.	19 hrs. at above temp.
Total time, hrs.	.....	65	67	75
Output, tons/hr.	.....	1.1	1.1	1.0
D. COILS, TUBE-TYPE FURNACE PRACTICES:				
Charged weight, lbs.	.....	60,000	.....	96,000
Firing time & temp. hrs. & deg. Fahr.	.....	20 at 1500 (fce.)	.....	35 to 1410 top and 1380 bottom
Soaking time, & temp., hrs. & deg. Fahr.	.....	10 at 1310 top and 1290 bottom	.....	10 at above temp.
Total time, hrs.	.....	30	.....	45
Output, tons-hr.	.....	1.0	.....	1.0

furnaces except at mill D.

From a comparison of furnace and steel temperatures, it would appear that steel temperatures should be favored to insure better control of uniformity and tonnage especially on heavy charges.

Slow firing is deemed the best since it is in use at three of the four mills. However, mill "B" uses it in order to purge the charges.

Proper firing and soaking temperatures and time setups appear to be functions of hot and cold mill practices, depending on the extent of control in rolling, finishing and reeling, the percentage of cold reduction, the degree of blast, and the physical form and weight of the stock.

From a tonnage standpoint, the practice of mill "D", whether in box or tube furnaces, is attractive. Based on the author's experience mill "D" is the most successful in obtaining the proper Rockwell and Olsen physical values as well as the desired grain structures.

The foregoing survey reflects the standardization and simplification of annealing practices for cold-reduced material. The salient feature of this standardization, such as predetermined firing and soaking time and temperatures varying with the charged weights of various grades, is predicated upon a uniform product from the hot and cold mills.

II. Surface Finish

As previously mentioned cold-reduced stock usually is furnished in three grades: black, steam blue and deoxidized. Production of black and steam blue is well standardized at all continuous mills and presents no problems to the operating force.

Black Practices

Ordinary precautions against the use of, first, leaky covers, cracked bases, bad or disturbed sand seals; and, second, poor shape of material (telescoped or loosely wrapped and bundled coils and sloppy piling of sheets), and the judicious use of waster sheets and care to uncap at low temperatures will insure the delivery of stock out of the anneal with proper oxide border of minimum depth and thickness. On stock requiring an even and uniform oxide, such as coils for alcohol drums, most mills rewind rather loosely before annealing.

Steam Blue Practices

Of late, some mills have to overprocess barrel stock because the hot mills can not roll these light gages; consequently it is necessary to tandem roll to gage and steam blue.

Such material is blued in the regular manner by applying steam when the charge has cooled to about 800 degrees Fahr. so that there is no danger of blowing the sand seal. Otherwise, removing the steam at about 400 degrees leads to condensation that provokes the formation of red oxide.

Deoxidizing Practices

By far, the bulk of the cold-reduced tonnages sent through the anneal is routed "deoxidize." This means that the original surface finish off the tandem mill must be retained. The retention of this finish has constituted a considerable problem at all mills.

Deoxidizing practices in use at different continuous mills follow. These practices, although aimed at control of the same defects, such as, blue border; carbon deposit or soot, and grey or matte (satiny white) finish, follow no set pattern because the origin or cause of the defects differs from mill to mill and the working out of the practices to eliminate or minimize these defects was necessarily conducted on a hit or miss basis.

As to the occurrence of these defects, the results varied in the same mill from fairly good to bad, even from the same charge and furnace. In some pots, considerable "blue" but with little soot was found, also much soot seemed to be accompanied by little "blueing". Some pots, however, came out practically free from "blue" and soot but always there was the presence of the matte finish.

Findings as to the cause of these defects likewise varied:

BLUEING

1. Presence of oxygen either from air or in the free state.
2. Presence of oxygen from combined oxygen of CO_2 in the gas.
3. Presence of excess water vapor in the gas.
4. Use of inferior equipment.

SOOT

1. Presence of oil on the steel.
2. Excess of CO in the gas.
3. Too low a dew point in the gas.

MATTE

1. Reduction of oxidized surface, or blued steel.

It, therefore, can be seen that these deoxidizing practices maintain control of these defects by the proper regulation of:

1. The atmosphere in contact with the charge throughout the annealing cycle (blue, soot or matte).
2. Equipment (containers) in which annealing was done. (blue or grey).
3. Steel annealed. (soot).

Regulation of atmosphere involved the application of a gas of suitable composition, pressure and temperature to the annealing pot.

Application of the gas varied. Some mills found it necessary to purge the charges for various intervals prior to charging the pots in the furnaces. See chart I. Other mills applied the gas only after the pot was placed in the furnaces, some immediately after charging and others when the steel reached a temperature of 1000 degrees Fahr.

All the mills, however, used DX gas cracked from natural gas but considerable variation existed from mill to mill as to the composition, pressure and temperature of the DX gas.

Pressures varied from 6 to 30 ounces (higher pressures obtained through booster pumps at the DX machines). Some mills used low-pressure regulators at the furnaces and also at the cooling stations, while others used no regulation and favored high pressures.

Composition of the DX gas likewise varied at the mills. Some used a high CO content and others required a low CO content but, in general, the gas/air ratio of the DX machines was regulated to produce a gas with a ratio of CO_2 to CO between 0.4 and 0.6 as shown by B—B' in Chart II which is taken from the work of A. G. Hotchkiss.

Dew points of the DX gas varied from 35 to 40 degrees Fahr.

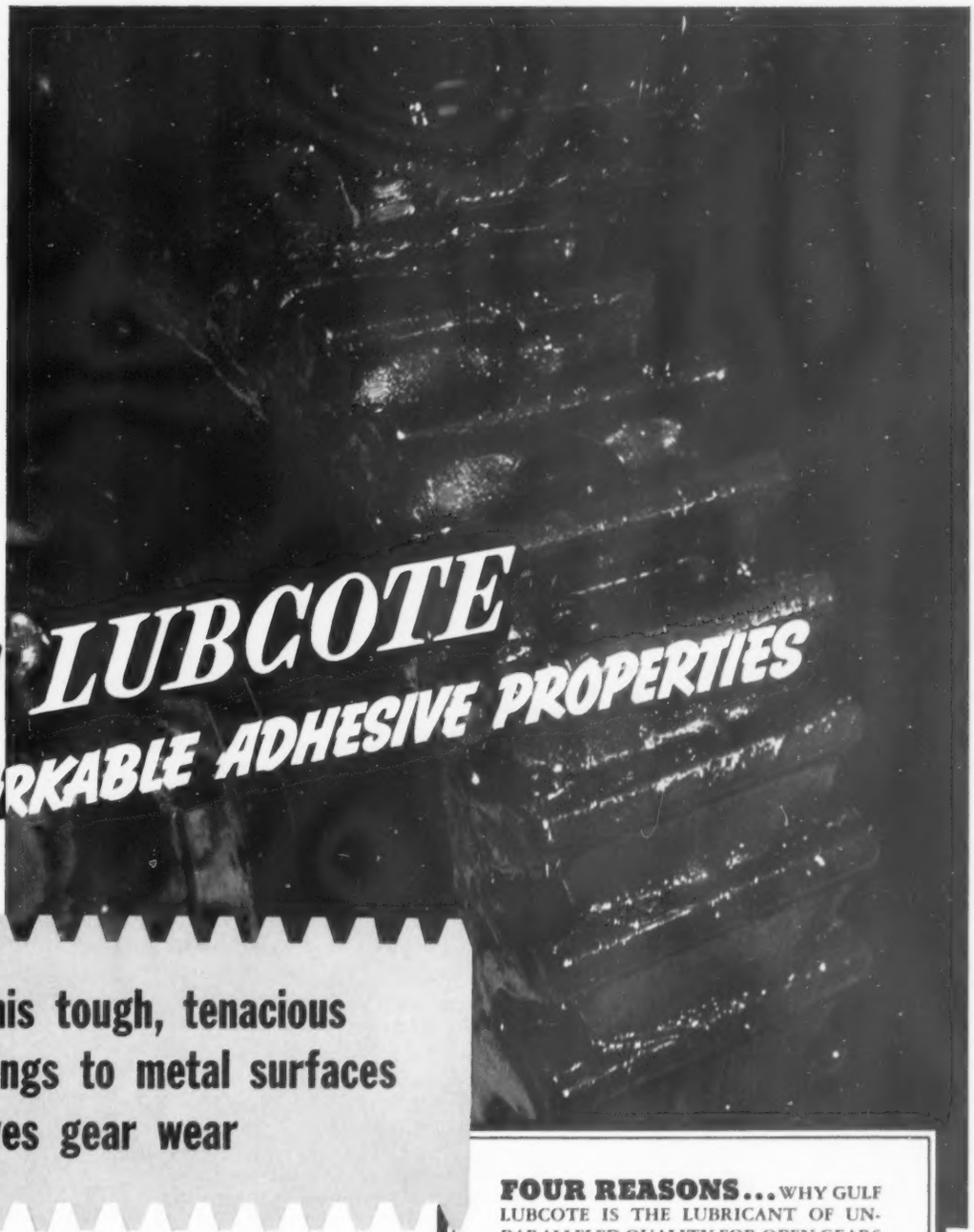
Regulation of containers involved careful inspection for leaky covers, cracked bases, bad goose-necks, etc. and the segregation of damp covers and sand from steam blue charges and other causes proved necessary at the mills. Further, closer control of uncapping temperatures had to be practiced at all times.

Regulation of steel—Several mills were forced to discontinue the use of oil in tandem rolling while others continued to roll in oil, but it is to be noted they carry a high-gas pressure and purge and bleed the pots.

The following lineups show some of the salient factors of deoxizing practices in use on cold-reduced stock. As far as practical results are concerned, there is little to be said of these different practices although the mills using higher pressures have the advantage based on consistent results.

Item	Mill 1	Mill 2	Mill 3	Mill 4
Type of gas	DX	DX	DX	DX
CO, per cent	5.8	6.4	5.0	5.0
CO_2, per cent	8.9	7.5	8.5	10.2
Dew point, deg. Fahr.	40	36	40	39
Regulators	Yes	No	No	Yes
Furnace pressure, in. water	2½	6	10	2½
Station pressure, in. water	2½	6	10	3
Bleed	No	Yes	Yes	No
Purge, hours	No	½	2	No
Gas on, deg. Fahr.	700	whole cycle	whole cycle	1000

It must be obvious, therefore, that the work of establishing a satisfactory deoxidizing practice is a difficult task because of the many variables that must be controlled until the proper combination is found.



GULF LUBCOTE HAS REMARKABLE ADHESIVE PROPERTIES

This tough, tenacious lubricant clings to metal surfaces . . . saves gear wear

GULF Lubcote has given a new meaning to the words "gear lubrication" to hundreds of plant operators from Maine to Texas.

Here is a *modern* gear lubricant — a special petroleum product which combines exceptionally high adhesiveness for metal surfaces with natural high viscosity and efficient lubricating qualities.

This heavy-bodied lubricant resists the wiping action of gears in motion, resists heat and decomposition and retains its original fluidity and high lubricating qualities for longer periods of time.

Gulf Lubcote is made in seven grades to fit various gear types, open or enclosed, and to provide for a wide range of operating conditions. Use it to lengthen the life of your gear trains and keep them operating without noise.

FOUR REASONS... WHY GULF LUBCOTE IS THE LUBRICANT OF UNPARALLELED QUALITY FOR OPEN GEARS

1 GULF LUBCOTES are heavy bodied products especially manufactured to have the requisite property of high adhesiveness for metal surfaces necessary in lubricants for open gears.

2 Due to selected crudes used and to the process of refinement employed, GULF LUBCOTES possess unusual lubricating qualities together with the essential property of flowing with the movement of the gear and pinion teeth.

3 The lubricating film provided by GULF LUBCOTES, in addition to being impervious to moisture, acid fumes and gases, will withstand extreme temperature changes without deterioration

4 Due to the tough and tenacious nature of GULF LUBCOTES they will effectively reduce objectionable gear noise and at the same time will provide maximum protection against corrosion, pitting or excessive wear of the gear teeth.

GULF OIL CORPORATION
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GENERAL OFFICES: GULF BUILDING, PITTSBURGH, PA.

GULF INDUSTRIAL LUBRICATION

Easily Assemble New Iron Fence

■ REVOLUTIONARY and important development in iron fence fabrication and erection has been accomplished recently by foundry engineers in co-operation with engineers of New York City park department. Complete malleable iron fence posts have been designed, including the rail cross fittings and the post finial.

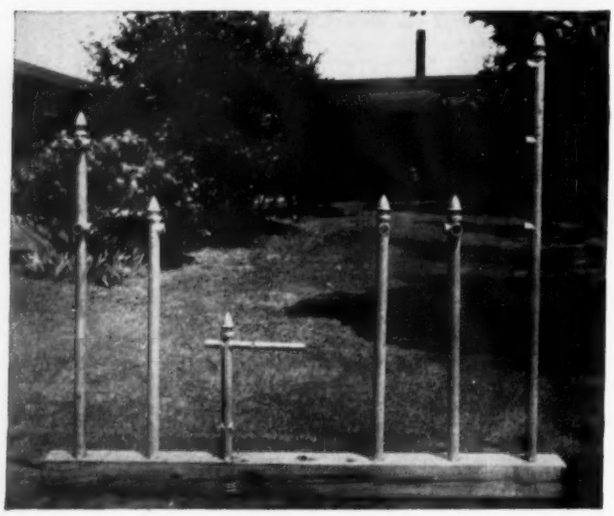
The posts are single units and need no assembling. Furthermore, all threading of the pipe railing sections has been eliminated. The rails are not connected to the line posts but pass directly through them. End or corner post fastenings are made by means of small pins. The railing sections themselves are joined by means of an ingenious malleable iron dowel.

This dowel, cast in accordance with the size pipe railing to be used, is driven into the pipe sections joining them tightly together. Random length pipe sections may be used, or the dowel unions staggered to suit conditions.

Until the development of this idea, iron pipe fences were constructed with an assembled post consisting of threaded pipe sections joined by means of a malleable cross casting. This casting also received the threaded rail sections. All pipe railings required accurate cutting and threading, and careful pre-erection calculations were necessary. The railings themselves were joined by a threaded sleeve. In all cases of repair or replacement of such fences due to corrosion, it was observed that the malleable cross casting remained in excellent and serviceable condition. This fact led to the design and production of the complete malleable post and dowel.

The elimination of all threading results in several distinct advantages. Due to the strains set up by the threading operation, corrosion always attacks and quickly destroys threaded parts. In addition, the reduced area caused by threading greatly weakens the pipe and post. For example, area figures reveal that an unthreaded standard one-inch pipe has a greater area, and therefore greater strength, than a threaded 1½-inch pipe. Thus the strength desired may be achieved by the use of smaller and less expensive pipe. Obviously, too, erection costs would be reduced materially. Economies would be realized in equipment, time and labor.

The great resistance to corrosion of malleable iron contributes definitely to the long life of these new fences. Ground line corrosion has always been a stubborn problem. Malleable iron posts, set in concrete, have proved to be a satisfactory solution to this problem. The posts are available for one, two or three rail fences. Corner angles may be had to suit the requirements of the purchaser.



Posts for the malleable iron fence are all single units and need no assembling

Flame Director Ring Used on Oil Burner

■ An interesting development of Electrol Inc., 934 Main avenue, Clifton, N. J., is the use of the flame director ring on its domestic oil burner for application on high temperature resistance steel.

Flame director ring projects into the combustion chamber and forms the fire so that it fits the refractory, giving maximum efficiency from the oil. Ring is cast of nickel chrome content steel and machined. This alloy, it is claimed, was the only one found to stand up under the intense heat of the oil flame, and the stresses due to the rapid heating and cooling of domestic operation.

Flame director ring developed by Electrol Inc., projects into the combustion chamber of the oil burner and forms the fire so that it fits the refractory

Issues Revised Edition Of Tool Steel Booklet

■ Cleveland Twist Drill Co., 1242 East Forty-ninth street, Cleveland, has published a third edition of its booklet "The Molybdenum-Tungsten High Speed Steels Marketed under the General Trade Name of Mo-Max." Prepared by the company's metallurgist, J. V. Emmons, who developed the steel, the booklet is expanded considerably from the second edition and brought up to date with inclusion of additional information.

Inserted is a 16-page section dealing with the microstructures of the molybdenum-tungsten and 18-4-1 types of high speed steels, this material having been prepared by R. G. Kennedy, research metallurgist of the company. Given in the back of the booklet is a complete listing of licensees of the molybdenum-tungsten steels in the United States, Canada and Germany, and a designation of tradenames under which the steels are sold.

Winter Glare Reduced

■ To reduce the glare experienced during winter months in buildings adjacent to open fields where large expanses of snow are present, Skybryte Co., Cleveland, has developed a pale-green adhesive liquid that can either be brushed or sprayed on the windows.

Product, which is known as Snopake, is claimed to admit over 90 per cent of the light and yet reduce it to a mellow, softly-diffused illumination. It is applied to the inside or outside of window and remains on the glass until removed with hot water and stiff, bristle brush.

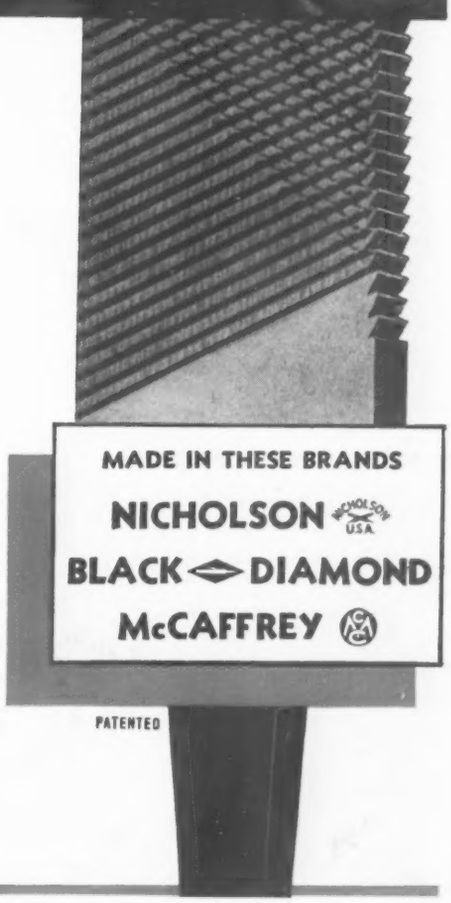
"NOTHING BUT THE FINEST," *says* "GE"

Finishing Room—General Electric Plastic Department

In equipping their new million dollar molding plant at Pittsfield, Mass., General Electric Company made no compromises. Nothing was spared to make the Plastics Department the finest, largest and most modern molding plant in the plastics industry.

This high equipment standard pointed in but one direction when files were to be chosen. Nicholson File Company files were chosen for the important tool room work of manufacturing steel molds, which must be precision-made—and for constant production cleaning flashes and fins from molded parts.

We are proud of our contribution to efficiency at this General Electric plant. And to thousands of plants everywhere, who rely on Nicholson, Black Diamond and McCaffrey Files for top performance. At mill supply jobbers' everywhere. Nicholson File Company, Providence, R. I., U. S. A.



Discussion Groups Prove Popular at Wisconsin Foundry Conference

■ SOMETHING NEW in the way of program planning proved markedly successful at the Wisconsin regional foundry conference held at the Schroeder hotel, Milwaukee, Feb. 3-4, under joint sponsorship of the Milwaukee chapter, American Foundrymen's association, and the department of mining and metallurgy, college of engineering, University of Wisconsin, Madison, Wis. The new type of program probably will find favor with similar foundry meetings in the future.

With the exception of three general sessions in which everyone attending the conference participated, the program was divided into four sections dealing respectively with gray iron, malleable iron, nonferrous and steel foundry practice. Sessions on all four subjects were conducted simultaneously forenoon and afternoon each day.

Only at the three general sessions were prepared papers or addresses presented. At the 18 individual sessions, discussion leaders briefly submitted topics for discussion and invited comment and questions. Discussion leaders were well selected and they experienced no difficulty in maintaining interest. The discussion was lively and extended and brought out information obtainable in no other way. One of the general sessions dealt with the evolution of castings from the blue print stage to the finished product, a second was devoted to apprentice training, and the third to foundry management.

Attendance at the conference was nearly 400, which was unusually high for regional meetings. The majority of the foundrymen came from Milwaukee and other cities in Wisconsin. However, outlying states were represented, including Illinois, Missouri, Indiana, Michigan, Kentucky, Ohio and New York.

Among gray iron foundry subjects discussed were: Cupola practice, sand control, electric cast iron, heat treatment, and causes of scrap castings and the remedies. On the subject of malleable iron, separate sessions were devoted to the consideration of melting, annealing, molding, core problems, scrap castings, and sand control.

Nonferrous foundrymen at four sessions discussed sand control, brass and bronze castings, molding practice including gate and risers, and aluminum alloys. In the steel group, discussion centered around cleaning room problems, melting, molding and casting, alloy steel heat treatment, and flame hardening.

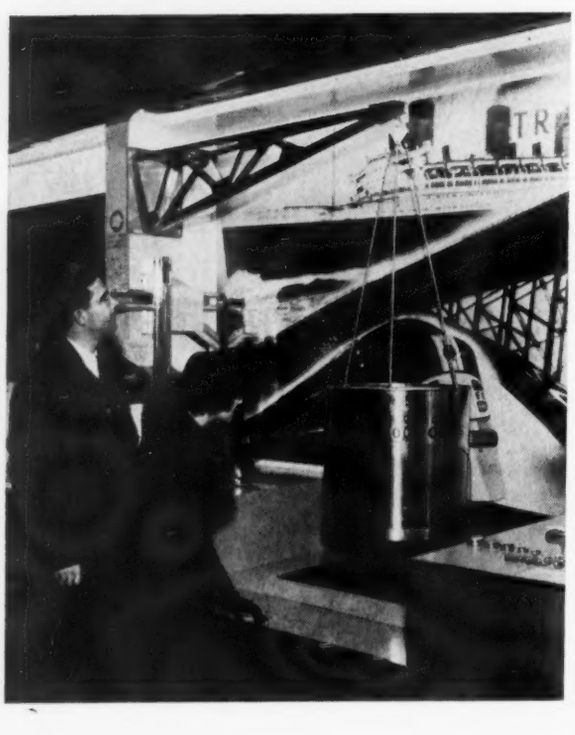
Demonstrates Sand Testing

H. W. Dietert, president, H. W. Dietert & Co., Detroit, showed several pieces of sand testing apparatus by which he demonstrated the action of sands under various conditions, explained the reasons underlying castings defects traceable to sand; described how to test sand for various properties, including bond, permeability, green and dry strength; and how to select and prepare the proper grade of sand to meet any casting condition in any of the metals usually handled commercially in the foundry.

Without minimizing importance of any individual feature, or the necessity of synchronizing all essential factors, Mr. Dietert directed particular attention to the necessity of providing a sand with the proper degree of resilience, or the ability to expand and contract without distortion. Many of the rat tails, buckles, scabs, and other forms of defects on the faces of castings are caused directly by a sand perfect in other particulars, but lacking in resiliency, he said.

At the opening general session, A. F. Pfeiffer, assistant general superintendent, pattern shop and foundries, Allis-Chalmers Mfg. Co., Milwaukee, presented a series of slides showing methods and equipment employed in the production of a wide variety of castings. Taking a large blower shell as an example, he described in detail the evolution of the casting from the original conception in the mind of the engineer, through the conference stage between drawing room, pat-

Alloy Beam Supports 300-Pound Weight



■ **A 300 - pound weight suspended from the end of this cantilever beam demonstrates the tensile strength of stainless steel. This demonstration is one of many at the stainless steel exhibition at the New York Museum of Science and Industry, Rockefeller Center, New York, sponsored jointly by the museum and Electro Metallurgical Co., unit of Union Carbide & Carbon Corp., New York**

tern shop and foundry, selection of lumber, molding method in relation to available equipment, crane and oven capacity, probable shrinkage, cooling strains, metal mixtures, cupola operation, pouring, shaking out and cleaning the castings in a hydraulic installation in which the saving is approximately 60 per cent over the former hand cleaning cost.

In the second general session, Victor Hydar, in charge of apprenticeship activities, Falk Corp., Milwaukee, explained the apprenticeship set-up as conducted by the state of Wisconsin. The system is arranged to work closely with the extension course conducted by the University of Wisconsin. Two circuit teachers contributed details on the methods of selecting candidates, methods of instruction, examination and other features.

Foundry Management Improves

At the concluding general session, D. M. Avey, secretary, American Foundrymen's association, Chicago, presented a paper dealing with many features of foundry management including: Improvement in quality demanding closer supervision of manufacture, materials and product; mechanization bringing need for practical knowledge of engineering; larger investments in plants, properties, and inventory requiring financial judgment; keener competition compelling merchandising knowledge; altered man power factors requiring improved personnel relations; swiftly changing economic developments demanding awareness of public tastes; steadily broadening influence of government and politics on business. Only within the past 10 or 15 years, the speaker claimed, have engineers had presented to them during their school years an accurate picture of the availability, usefulness and tremendous future possibilities of castings application.

Cupola Is Subject for Birmingham Conference

■ The sixth annual joint foundry practice meeting of the Birmingham section, American Society of Mechanical Engineers, and Birmingham district chapter, American Foundrymen's association, to be held at the Tutwiler hotel, Birmingham, Ala., Feb. 24-25, will take the form of a symposium on the mechanics of the cupola and auxiliary equipment.

The program schedules technical sessions on morning and afternoon of the first day and afternoon of the second day, at which a number of short papers will be devoted to various phases of the general subject. Extensive discussion will follow. A luncheon has been arranged for the first day and a banquet at the close of the second.

Details of the program follow:

Thursday, Feb. 24

MORNING

The Cupola Furnace—Design, Construction, Maintenance

"Balanced Blast Cupola," by W. L. Rouche Sr., McWane Cast Iron Pipe Co., Birmingham, Ala.
"Acipco Hot Blast Cupola," by J. W. Cotlin, American Cast Iron Pipe Co., Birmingham, Ala.
"Griffin Hot Blast Cupola," by L. H. Rudesill, Griffin Wheel Co., Chicago.
"Plain Cupola," by Clyde Hagler, Continental Gin Co., Birmingham, Ala.

NOON

Luncheon. Speaker: H. Bornstein, director, testing and research laboratory, Deere & Co., Moline, Ill., and president, American Foundrymen's association.

AFTERNOON

Cupola Charging Equipment

"Shepherd Charger," by Max Kuniansky, Lynchburg Foundry Co., Lynchburg, Va.
"Whiting Wish-Bone Charger," by A. W. Gregg, Whiting Corp., Harvey, Ill.
"Dump Charger," by Victor Szwed, United States Cast Iron Pipe Co., Birmingham, Ala.
"Acipco Charger," by Dan Guldberg, American Cast Iron Pipe Co., Birmingham, Ala.
"Skip Hoist Charger," by E. B. Bradley, Phillips & Buttorff, Nashville, Tenn.
"Charging by Hand," by Lynn Malloy, Anniston Foundry Co., Anniston, Ala.

Friday, Feb. 25

MORNING

Plant visitation.

AFTERNOON

Cupola Blowing Equipment

"Selection of Cupola Blowing Equipment," by S. D. Moxley, American Cast Iron Pipe Co., Birmingham, Ala.

EVENING

Banquet. Speaker: Spencer McCallie, head master, McCallie School for Boys, Chattanooga, Tenn.

Collective Bargaining Facts Are Assembled

■ *Collective Bargaining in the Steel Industry*, 1937, by industrial relations section, Princeton university; paper 43 pages 8¼ x 10¾; supplied by STEEL, Cleveland, for $1; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This is a factual summary of recent developments in collective bargaining, prepared by Frederick H. Harrison, research assistant in the department of economics and social institutions of Princeton university.

The report grew out of an analysis of current trade union agreements in the steel industry. Early in this study it was found necessary to probe into circumstances surrounding these agreements to understand them correctly.

This volume is, in a sense, an interim document, published without delay on account of the immediate demand for facts. It is a product of extensive analysis and field work. Industrial executives, trade union officials, rank and file workers and government representatives have been interviewed for first-hand information and opinion.

Builds 28-Passenger Rail Car

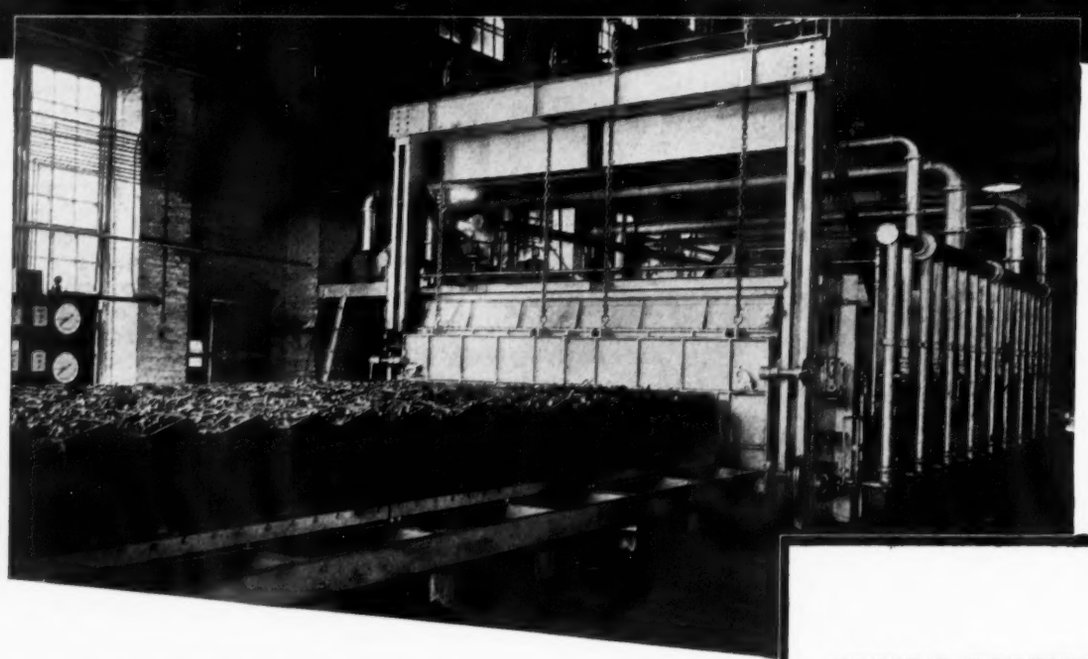
■ **This 28-passenger rail car, purchased by National Railways of Colombia, will be used out of the city of Barranquilla, Colombia. It was built by Brookville Locomotive Co., Brookville, Pa. Car is powered by a V-8 Ford engine. It is equipped with heavy duty truck clutch and 4-speed transmission. Final drive transmission which also gives full reverse is equipped with spiral gears and pinion, and Timken roller bearings. Four operating speeds are provided in both forward and reverse besides Westinghouse air brakes with hand controlled emergency**

BECAUSE

"IT SHORTENS HEATING-UP TIME AND SAVES DELAYS"

THE TREND TODAY IS TO GAS

FOR ALL INDUSTRIAL HEATING



Recent improvements in industrial Gas equipment make this preferred fuel even more economical and efficient. Up-to-date Gas applications provide quick heating, a uniformity in heat distribution, and an automatic accuracy of control that make for lower production costs regardless of the size of either plant or job.

Cleanest of all fuels, and the highest in utilization value, Gas also is instantly available in unlimited supply, thus offering unmatched *natural* advantages which speed production, lessen shut-downs, reduce spoilage and bring appreciable savings in the manufacture of your products.

Let an industrial engineer from your gas company demonstrate how modern Gas equipment, properly installed, cuts over-all costs and puts production on a more profitable basis.

THERE'S NOTHING

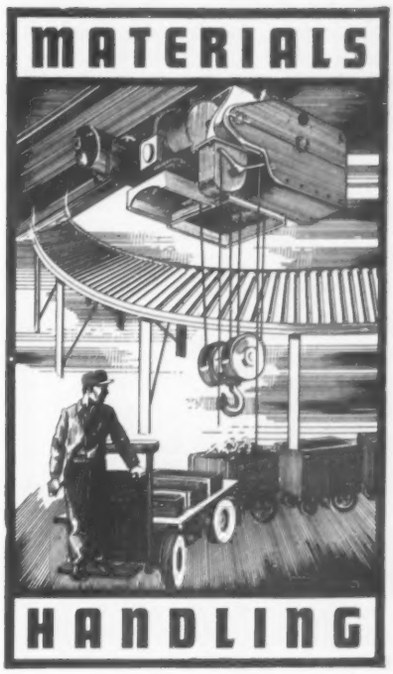
LIKE **GAS**

FOR

HARDENING CARBURIZING
ANNEALING FORGING
TEMPERING GALVANIZING
NORMALIZING CORE BAKING
BLUEING MALLEABLIZING
NITRIDING
AND MANY OTHER
INDUSTRIAL PROCESSES

AMERICAN GAS ASSOCIATION

INDUSTRIAL GAS SECTION: 420 LEXINGTON AVE., NEW YORK



Special Controls

Use of larger and faster materials handling equipment has resulted in complimentary control being developed to produce maximum benefits

By R. H. ROGERS
Industrial Department, General Electric Co., Schenectady, N. Y.

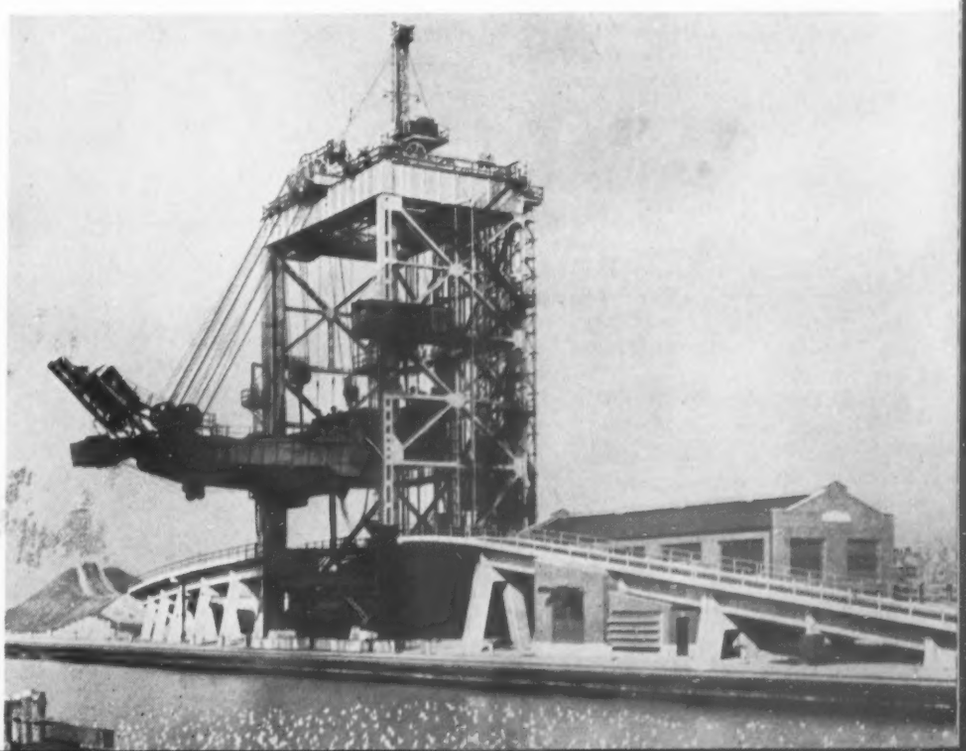
■ AS A RESULT of a much greater demand for materials handling equipment of all types, many innovations in application of electrical apparatus were introduced in the past year. While relatively little new electrical equipment was designed specifically to meet handling problems, installation of larger and more complex systems necessitated new and more flexible schemes of control.

Among various installations of this nature were a new car dumper at Huron, O., a new extensive system of belt conveyors in a midwestern iron mine, a continuously operating skid hoist in a midwestern steel mill and the largest and one of the fastest mine hoists in America. In addition, electron-tube rectifiers were applied successfully to elevator service, as were 1800-revolutions per minute, motor-generator sets.

A variable-voltage car dumper built for the Wheeling & Lake Erie railroad, is said to be the most powerful yet constructed. It is of the lift-and-turnover type and will handle an average of fifty 120-ton cars per hour. The electrical equipment is designed conservatively to handle the full capacity of the dumper on a continuous basis, and is arranged so flexibly that the dumper can still handle the maximum load even though a major piece of electric equipment should fail. Wherever possible, the plant has been made automatic in operation. Two motor-generator sets, each rated 1275 kilowatts at 720 revolutions per minute, supply direct current power for the mule and cradle drives as well as the auxiliary drives. Adjustable voltage control is employed on both mule and cradle drives. Each of several special thrustor brakes on the main drives has sufficient capacity to hold the cradle in position.

Power for the main drives is supplied by two 4-unit, 5-bearing, synchronous, motor-generator sets, each consisting of two 450-kilowatt, adjustable-voltage generators and one 375-kilowatt, constant-voltage generator, driven by a 2300-volt synchronous motor. The mule and cradle are each driven by two similar 500-horsepower, direct-current motors whose armatures are duplicates of those for the 450-kilowatt generators so one armature serves as a spare for the four generators and four motors used for the main drives. A diversity of loading on the dumper is obtained by having one generator on each of the main sets connected to the mule and the same hook-up used on the cradle which is counterweighted to reduce power demands. The cradle is coming down light while the mule is handling a loaded car and, similarly, the load on the mule is light while the cradle is being hoisted under load.

Installation of two new skip hoists for blast-furnace service by a large midwestern steel company marks the first use of 3-field generators and variable-voltage control



Lift and turnover type car dumper, built for Wheeling & Lake Erie railroad is said to be the most powerful yet constructed. It will handle fifty 120-ton cars per hour.

with such equipment. In the case of each of these hoists, the electric equipment consists of two 3-field generators and two shunt-wound motors. The sloping-speed characteristics of the equipment enable each of the two motors to be run from its own generator, thereby limiting the maximum voltage to the voltage of one generator. Conventional variable voltage system with shunt-wound generators would require a series connection that would double the voltage. A new scheme of controlling the fields has been developed to give substantially constant low speed while the hoist is dumping into the furnace regardless of the kind of load being handled.

Construction of electric equipment for what is said to be the largest and probably the fastest alternating-current mine hoist in America was started last year. It will be installed at the Wenonah No. 9 mine of Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. More than 6000 feet of wire rope will be wound around the 18-foot drum in hoisting the unbalanced load of 50,800 pounds. This enormous load will travel up the steep slope at a speed of 3600 feet per minute, or approximately 41 miles an hour. Only 10 seconds will be consumed in loading or unloading the car. The hoist motor is rated 2500-horsepower, and the control is reversible, full magnetic. Dynamic braking will be used to control the speed when lowering. The resistor alone will weigh approximately 30,000 pounds. The Tennessee Coal, Iron & Railroad Co. has had in operation for several years three similar hoist equipments which operate at a rope speed of 2700 feet per minute.

New Tires for Industrial Tractors and Trailers

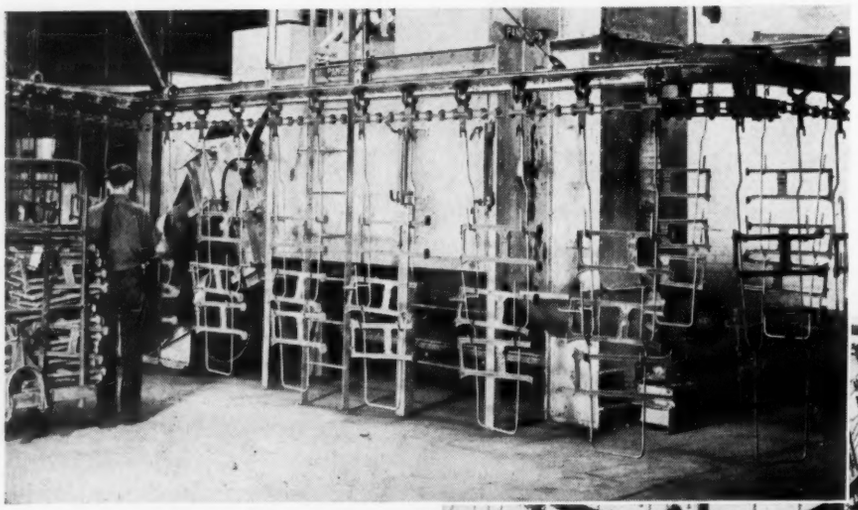
■ Oil resistant rubber tires for industrial trucks, tractors and trailers have been announced as a recent development by B. F. Goodrich Co., Akron, Ohio, which is now introducing them under the trade name, "Oil-Pruf."

They are said to resist the action of animal, vegetable and mineral oils, and to retain their original physical properties approximately 30 per cent better than others tested when used in the presence of oils and other solutions usually classed as rubber solvents. According to Wilson C. Bray, manager of the company's truck and bus tire department, there has been a marked increase in the use of rubber tires on trucks and trailers used in intra-plant transportation.

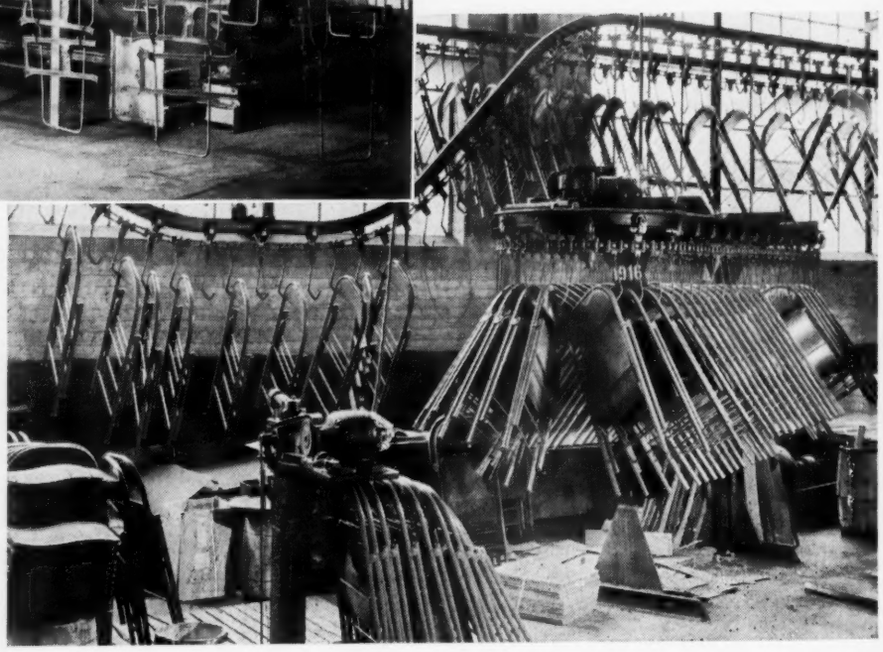
This has been an accompaniment of the rapid development and wider uses of mechanized materials handling equipment. Industrial rubber tires have been placed in service under operating conditions which a few years ago would have been considered impractical, if not impossible, from the standpoint of satisfactory tire performance. In steel mills and metalworking establishments, lathe cuttings and other sharp materials are found often on floors and runways, causing tires to fail prematurely, and accelerating the rate of normal tire wear due to load and abrasion. Presence of oils on floors and yard pavements often causes or-

(*Please turn to Page* 73)

Conveyors Facilitate Chair Manufacture



■ Left, overhead conveyor is shown handling castings through sand blast machine in foundry of American Seating Co., Grand Rapids, Mich. Photos courtesy Link-Belt Co.



■ Right, two overhead conveyors handling tubular steel folding chairs. Chair frames are taken off long upper conveyor to permit riveting seats. Following this operation, they are placed on the short lower conveyor, which moves them along slowly while rubber tips are applied. Completed chairs are then removed, boxed and dispatched to shipping room on platform-type conveyor

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Shielded-Arc Automatic Welding Is Developed

■ AN AUTOMATIC welder using a shielded arc is one of the more recent advances in welding. Although continuous automatic arc welding is not new, it has previously been limited to the use of bare welding rod. This new development now makes it possible to obtain the many advantages of shielded-arc welding in addition to continuous automatic operation.

Una Welding Inc., Cleveland, has developed the automatic equipment which applies tape to the bare welding rod and feeds it into the arc. The "taper", as this equipment is called, is mounted just below the automatic head which controls the welding rod feed.

Notched welding rod meshes with a geared feed roll assuring positive feed. Two motors drive the feed roll through a universal gear set. The two motors revolve in opposite directions and are connected to differential gears so when both motors are running at the same speed the resultant speed at the feed roll is zero.

Up motion of the welding rod is produced by a constant speed motor.

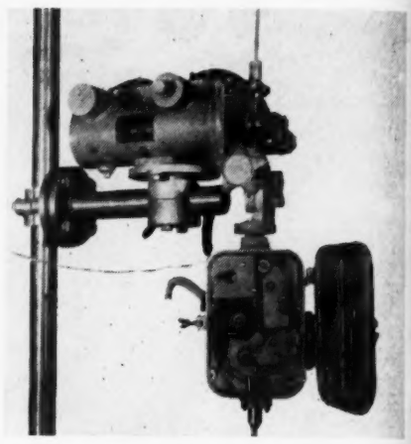
Down motion is produced by a variable speed motor whose armature is connected across the direct current arc so its speed varies with arc voltage. With alternating current welding, a rectifier changes the voltage drop across the arc to direct current suitable for driving the down motor.

When down motor speed exceeds up motor speed, welding wire is fed into the arc. Speed of feed closely follows the arc length as change in arc length varies voltage across the down motor. A variable resistance in the down motor circuit provides an adjustment effective over a wide range.

The taper mechanism which makes possible the shielded arc is mounted just below the automatic head. Tape is fed through forming rolls, guide block, closing roll and emerges completely enclosing the welding rod. An alloy contact shoe rides the welding rod in a small slit formed by the tape just before it closes around the rod. Tape is impregnated with materials forming protective gases in the arc, and fine wire is woven in it to hold the tape in shape when formed around the welding rod.

A typical application where this equipment has been found valuable is in welding crane girders at the plant of the Cleveland Crane & Engineering Co., Wickliffe, O. Used on girders for 40, 80 and 120-foot cranes, the automatic shielded-arc equipment described above gives welding speeds as high as 90 feet per hour.

Two automatic welders are employed operating simultaneously to weld both sides of the girders. This helps avoid distortion and by combining controls speeds up the entire operation. On ¼-inch vertical plates, a ¼-inch fillet is placed in one pass using ¼-inch welding rod with 300-340 amperes alternating current. A speed of 85 feet per hour is obtained. Welders are mounted on framework moving down the length of the girder. Electric hoist mechanisms provide the vertical movement required to accommodate the curve in the girder sections.



Automatic welding head with taper below. Door on taper mechanism is open

On similar work between 5/16-inch vertical and ⅝-horizontal plates, two passes are made, the first at 90 feet per hour and the second at 60 feet per hour. Current varies from 380 to 400 amperes.

This new equipment has been found valuable for much other production work such as construction of special channels, girders, machine bases, tanks and troughs. Where either a large number of similar pieces or long welds on perhaps a comparatively few pieces are involved, shielded-arc automatic welding offers many advantages.

Both 3/16 and ¼-inch welding rod is used in the same machine through interchangeable rolls and nozzles. Additional capacities are now being developed which are expected to greatly expand the application of these machines.

Una automatic shielded-arc welders working on crane girder at Cleveland Crane & Engineering Co., Wickliffe, O. Curve in girder section is accommodated by electric hoists which provide vertical movement required

Plowshares Hard-Faced

■ For six years two plowshares which had been drawn out, sharpened and hardfaced with Haynes Stellite, a wear-resistant alloy developed by Haynes Stellite Co., 205 East Forty-Second street, New York, have been in steady service, plowing over 600 acres of land.

The alloy was applied to the top and bottom of the point and landside of the shares and extended back 2 to 2½ inches on the point. Since the time the alloy was first applied the plowshares have never been sharpened.

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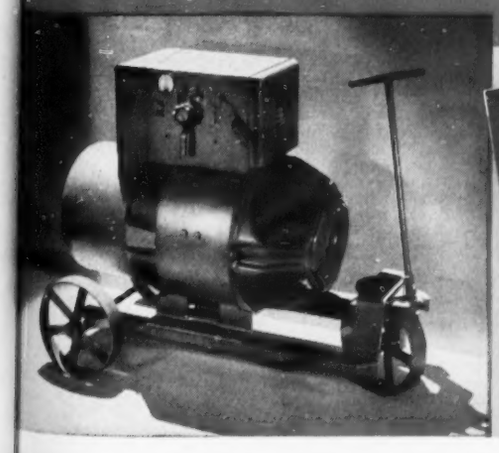

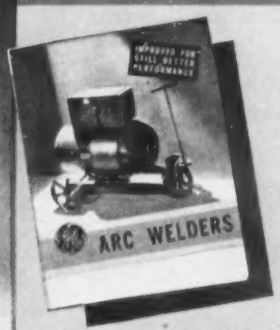

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Air Conditioners Use Much Fabricated Steel

■ CONSTRUCTION of a large number of new houses is expected to increase steel consumption in a number of lines. One product already showing increased activity is air conditioners, now being included in practically all houses in the $7000 class and higher. A good proportion of new houses in lower price ranges are also including this equipment.

A study of air conditioners manufactured by the Fox Furnace Co., Elyria, O., reveals a large amount of steel utilized in their construction. Several interesting steps in fabrication are also employed.

Units are made for use with oil, gas or coal as fuel. Heating capacities range from 50,000 to 331,000 B.t.u.'s per hour, and full automatic control is provided with oil, gas and stoker fired models. The automatic units heat, filter, humidify and circulate the air. In addition, a refrigeration unit can be supplied to cool and dehumidify the air in summer, when this also is desired.

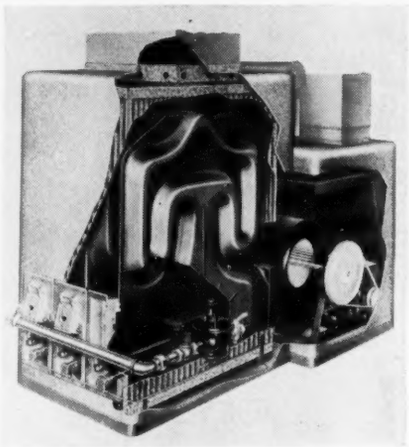


Fig. 1—Gas fired air conditioner showing exterior cabinet, inner casing, formed steel heating elements, blower and burners

Conditioners Employ Steel

Series M conditioners, illustrated in Fig. 1, have furniture steel exterior cabinets; corrugated, galvanized, inner castings; and steel blower shells, frames and supports. They also employ an interesting use of steel in the heating element. This is formed from 16-gage steel in a 500-ton hydraulic press with a deep draw of about 3 inches. Two of these sheets are then welded together to form passages for the burning gases. Internal areas carry a number of spot welds to secure these sections together, and an arc weld is carried around the outside edge to fasten and seal the entire unit.

These heating elements are used in multiple, the number varying with the capacity of the particular air conditioner under construction. Gas burner and thermostatic pilot are located in the lower part of each heating element, this type of element being used only on gas fired conditioners.

Several other models including oil and coal burning units utilize a heating element fabricated from 7-gage boiler plate steel in the drum section and 12-gage steel plate in the radiator. Figs. 2 and 3, taken in the modern fabricating shop which forms a part of the Fox plant, show various steps in the construction of these heating elements.

Fabrication practice here involves several unusual steps. After cutting sheets for the drum or boiler section to size, holes for fastening to the front door frame are punched in both ends. A hydraulic multiple punch press speeds this work by simultaneously punching a complete set of holes in one end of the sheet at one stroke. The flue hole is punched out next.

Domes Tack-Welded

Then the angles for the apron over the fire door are cut by oxyacetylene torch in an automatic templet guided machine. Sheets proceed to the forming rolls where they are given the cylindrical shape required to make the boiler or drum section of the heating element.

Domes for these boiler sections are generally made of 6-gage plate and are deep drawn in the 500-ton hydraulic forming press, aligned in the top of the boiler and tack-welded in position. An overhead hoist operating on a circular track over this section of the shop is used to place the boiler in the pneumatic punching and cold riveting machine shown in Fig. 2. Rivet holes are punched around the top, the operator merely stepping on a trip lever to punch a hole, withdraw the die and index the boiler ready for the next hole. The punching die is then changed over to a riveting head, rivets inserted and upheaded cold in the same machine.

By punching rivet holes through both side and dome sections simultaneously, perfect alignment is secured without drifting or distorting metal to make rivets fit. This also enables a tight fitting rivet to be used, the body of which expands to completely fill the hole during riveting. Because the work is riveted cold, there is no subsequent contraction. These factors combine to produce an unusually tight seal.

After riveting, the joint is also completely welded, giving added strength and assurance of a perfect seal, one that will remain gas tight throughout the entire life of the heating element.

Those models with fire doors have an apron extending down to the door opening. This apron is punched and riveted as described above, the portable pneumatic machine shown in Fig. 3 being employed for this work.

Radiator sections used with the boiler section described above to form complete heating elements are shaped in a unique manner. After forming to a cylinder with the lon-

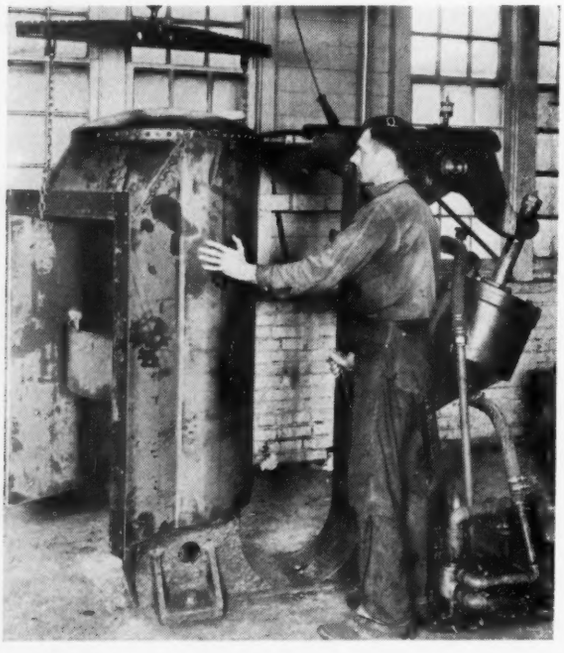


Fig. 2—Cold riveting domes in pneumatic riveter to form boiler section of large heating elements

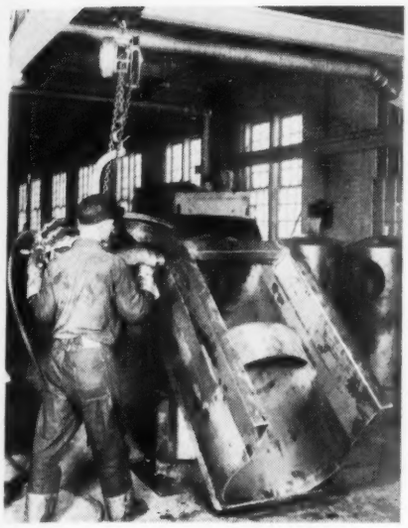


Fig. 3—Portable pneumatic riveter and punch used in fastening aprons to boiler sections

gitudinal seam riveted, the radiator is placed in the hydraulic press. A V-section die hinged at the apex of the V is inserted in the radiator and the press closed, forming the crescent shaped radiator section required to fit around the boiler. Large rollers in this die at the tips of the V produce the desired curvature at the ends of the crescent. Top or moving portion of the press die is also somewhat V-shaped. As the press closes, the moving die enters and spreads the hinged internal die to change the circular cross section of the radiator into a crescent, producing this unusual section at a high rate of production and with perfect accuracy so end sections used to close up the radiator fit without any difficulty.

Arrangement of machine and equipment in the fabricating shop received adequate consideration so that a smooth flow of work results. Sheets enter one end, are trimmed, punched and cut out for the apron and flue along one side of the shop. As they come up to the other side they are formed, heads tackwelded, riveted and seam welded. Radiator sections are then assembled and mounted on the drum to form the completed heating element which is returned to stock. Hoists and jib cranes facilitate handling.

Sheet is handled on roller tables for the hydraulic press and multiple punching operations.

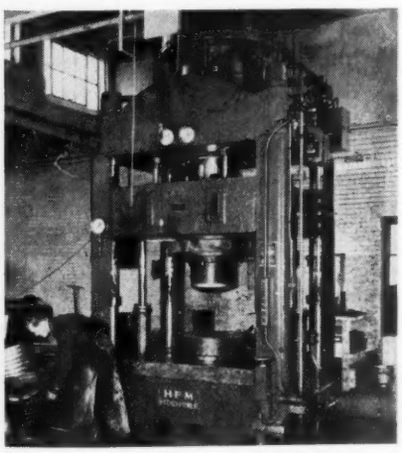


Fig. 4—Hydraulic forming press, 500-ton capacity, used in production of domes and heating elements

Steel Failures Due To Design Mistakes

■ In a recent investigation of complaints due to failures of steel it was found that out of about 250,000 tons of assorted engine forgings the failures numbered less than 1 per cent, according to R. A. MacGregor, chief metallurgical inspector for the government of India, Jamshedpur, that country, at a recent meeting of the Mining and Geological institute of India held at Jamshedpur.

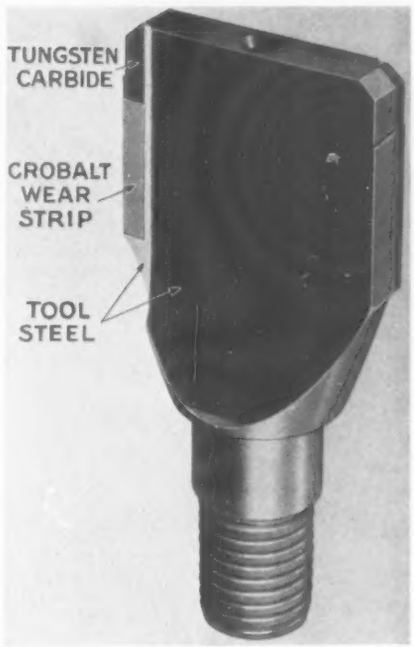
General experience with service failures, said Mr. MacGregor, has shown that in only a few cases can poor quality of steel be blamed. The great majority of failures arise from the engineers' misuse of the material after it has left the steel plant.

Wear-Resisting Alloy Is Introduced

■ Announcement is made by Michigan Tool Co., Detroit, of the availability of Crobalt, a cast alloy consisting chiefly of cobalt, chromium and tungsten. Highly resistant to abrasion, heat and all forms of corrosion, it may be welded or brazed on soft or hard steel. It is being used as a cutting metal, particularly in the automotive industry. In cutting characteristics it is said to fall midway between high-speed steel and cemented tungsten carbide.

An interesting application for wear-resisting purposes is on tungsten carbide tipped tools. Frequently the bodies of tipped tools wear out before the tungsten carbide. Addition of wear-strips to the tools, as shown in the accompanying illustration, is said to solve this problem.

Crobalt is recommended by its makers for use in such typical items as boring bar pads, locating pins, lathe centers, chuck jaws, steady rests, plug gages, plug thread gages, drill and reamer guides, valve seat inserts, scrapers for road machinery, locating pads,



Flat boring tool tipped with tungsten carbide for cutting and Crobalt guide strips for long life of tool body

snap gages, tube flaring tools and the like.

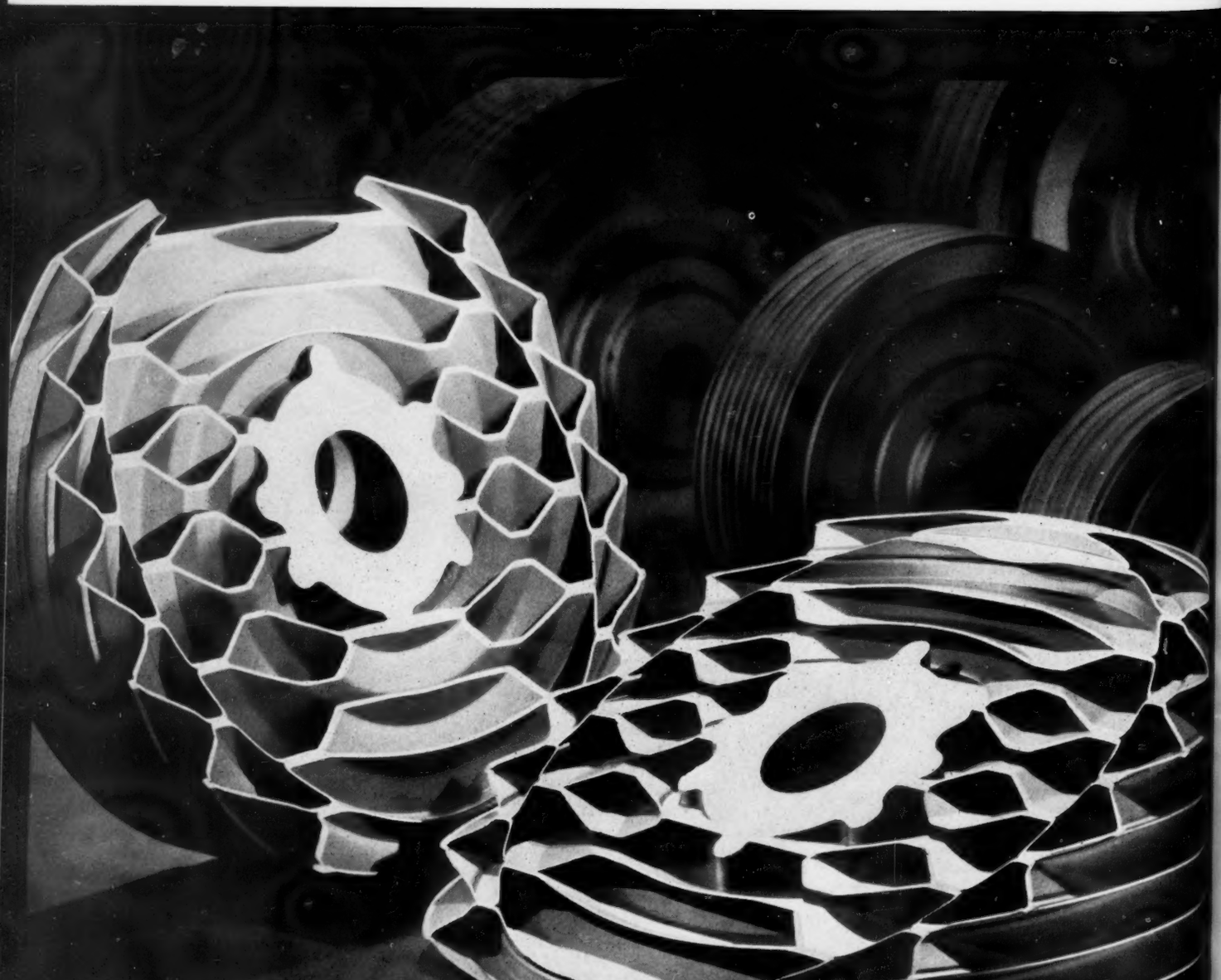
Cleveland Welding Group To Study Metallurgy

■ Cleveland section of the American Welding Society is sponsoring for the benefit of its members a six-lecture educational course, "Fundamental Metallurgy, An Outline of Metal Science for Welders." The course will be presented by Harry B. Pulsifer, director, Cleveland district laboratory, American Steel & Wire Co. Lectures will be in the Bingham building, Case School of Applied Science on the evenings of Feb. 2, 16 and 23 and March 2, 16 and 23.

Metals in Paper Field

■ Attempting to distribute information on ways and means that pulp and paper manufacturers may improve operating efficiency and product, International Nickel Co., 67 Wall street, New York, has published an 8-page paper by A. G. Zima entitled "Nickel Alloy Steels and Cast Irons in Pulp and Paper Industry."

Specific illustrations combined with tables pertaining to alloys and their application are presented with a discussion centering chiefly around the sulphite pulping process. Copies are now available at the above address and may be obtained upon request.



The inside story . . .

THIS illustration tells the inside story of Duro-Brace Texsteel Sheaves.

Lightness (in order to reduce bearing pressures to a minimum) is highly desirable in a sheave, but none of its strength may be sacrificed to this end.

Allis-Chalmers engineers set about this seemingly contradictory problem and solved it by designing an interior grid-type of construction, which gives the strength and rigidity of cast iron with the lightness of pressed steel, and a smartness in appearance that adds distinction to any machines equipped with them.

In this design the outside walls of the sheave are also reinforced by convex steel plates, which so greatly increase their strength as to eliminate distortion even under the severest duty. The result is a light, true-running, vibrationless drive always.

Duro-Brace Texrope Drives are silent, 98.9% efficient, slipless, shock-absorbing, require no belt dressing or lubrication, and are not affected by dirt or moisture.

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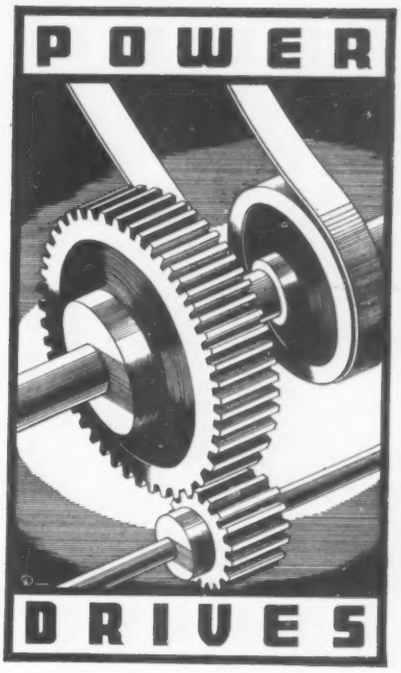


Drive Standardization

In planning and installing group or individual drives, standardization of equipment and arrangement economizes in spare units, installation expense and maintenance

■ WITH MODERNIZATION of group drives, standardization offers many economies in application and operation and in connection with future changes.

When large group drives were in vogue the general practice was to design each group as a unit. This required large diameter shafts where the power was applied. In many cases the main shaft was driven by motors as large as 200 horsepower or by even larger engines.

Many engine-driven groups were arranged to drive the entire plant through a main belt or rope, and 5-inch mainshafts were common. Shafts to individual lines were of various diameters. This resulted in a multiplicity of sizes of bearings, hangers and pulleys of various bores. On most of the older installations, solid and split cast-iron pulleys predominated, with some bushed split-steel and wood pulleys. Most of such equipment, except bushed pulleys, was not interchangeable and seldom fit on new installations.

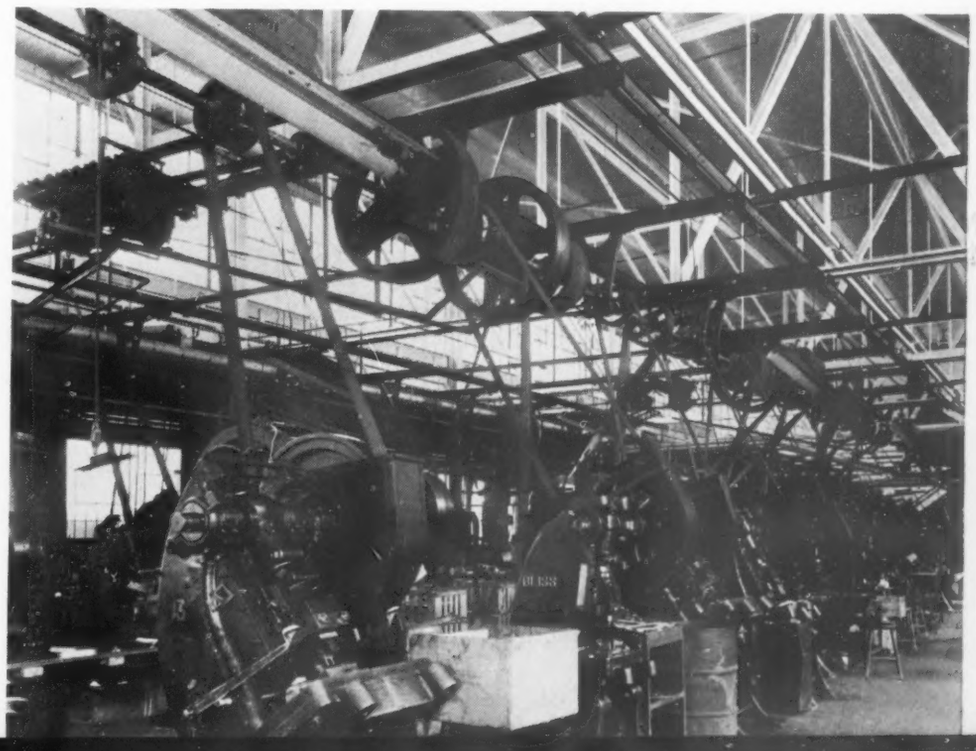
Most of such large drives have been subdivided, with the main shafts discarded and other shafts driven by individual motors. This has eliminated the large diameter shafts, clutches and cutoff couplings with their heavy friction load. One plant reported a 50 per cent saving in power by the elimination of the single central drive and mainshafts by placing a motor on each individual shaft.

Modernization of group drives, however, usually requires further subdivision of the machines into smaller groups of about five to ten machines each. Generally a regrouping of machines is advisable to permit operation or idleness in slack periods, of the machines as a group. This results in greater flexibility of operation and reduces the necessity of running a large group, or even a small group, to operate only a few machines.

By standardizing the drives and method of installation, in any modernization program, much can be saved in first cost, in operation and in connection with any future changes that may be necessary. Standardization does not necessarily mean all groups are made the same size or alike or that all machines are group driven. Good planning does not always permit this.

Usually it is possible to standardize group drives to a single shaft diameter, bearing and hanger size, to two or three speeds, sizes of motor and control, and practically always to the method of mounting. This permits greater interchangeability of the component parts, necessitates a lower investment in spare parts and drive units, and permits reuse without loss in case of rearrangement.

Three lineshaft speeds are sufficient for most plants; one speed for



Group drives are standardized as to speed, size of motors and special steel superstructure for mounting lineshafts and motors. Photo courtesy Dodge Mfg. Corp., Mishawaka, Ind.

groups of general machine tools, another speed for screw machines, and a third, higher speed for polishing and buffing machines. In this way the pulleys on the shafts can be arranged to give the proper shaft speed from standard speed motors so the motor pulley does not have to be changed in case a motor fails, and a spare motor is substituted. Not having to change pulleys or belts saves considerable time in a changeover.

The same is true of V-belt and chain drives. When these are standardized as to size and center distance, any slight adjustment necessary in the center distance is easily made in the motor base. Chains and V-belts need not be changed as long as sprockets or sheaves and center distances are the same.

In modernized group drives, motors are also standardized in horsepower rating. For example, a common practice is to use three motor ratings, such as, 5, 7½ and 10 horsepower or 10, 15 and 20 horsepower. In this plan the different sizes are rated on a 2 : 3 : 4 ratio. If a group for example, becomes too large for, say a 5-horsepower motor, a 7½ horsepower drive is installed, and so on. When too large for a 10-horsepower motor, the group is subdivided into two groups driven by a 10 and a 5-horsepower motor or into two 7½-horsepower groups.

This powering plan provides extreme flexibility to meet changing requirements with a minimum number of spares necessary and avoids a multiplicity of sizes of motors. Controls, also, are of a size to match the motors, thus making it easier to replace and to keep an ample stock of repair and replacement units and parts. In extending electrical circuits to the various motor locations, leads with capacities for the largest motor in the series are installed, thus providing for possible changes.

In most cases the lineshaft can be standardized to one or two diameters, thus making pulleys, bearings and hangers interchangeable. The common use of split pulleys with bushings permits fitting pulleys to any diameter of shaft. A line of solid cast-iron pulleys with interchangeable bushings recently has been placed on the market.

Metal More Economical

Standardized metal superstructure for supporting lineshafts is always an economy over wood because of its greater utility in case of change, increased rigidity and ease of erection. Steel superstructure is of two types; one type consists of special rolled shapes fitted together in pairs, with spacers between to permit attaching cross footings for hangers and bolting to the building framework or to ceiling inserts. This type of structure is specially designed for strength, rigidity and ease of erection, and is light in weight. Similar crossrails or footings permit easy mounting of motor or countershafts. These sections are purchased in convenient lengths and practically 100 per cent salvage is possible.

A common practice in large plants, where the layout of machines and drives is subject to frequent change, is to keep an extra supply of these steel structural pieces. When a change is to be made, the spare stock is erected, the lineshaft moved and the original superstructure placed in stock ready for the next change.

In the other type of superstructure two pairs of structural channels are used. Each pair is bolted together back-to-back, with washer spacers between to permit inserting bolts for fastening to the roof trusses and to attach crosspieces for the hangers. Lighter channels are used for crosspieces for hanger footings and to attach countershafts and motors.

Such structural work must be laid out, drilled for spacer bolts, and assembled. One advantage is that the standard structural channels are easily obtainable and made up as needed. On the other hand they are generally made for a specific installation and are not generally made to fit every installation, as are the shapes specially designed for wide application.

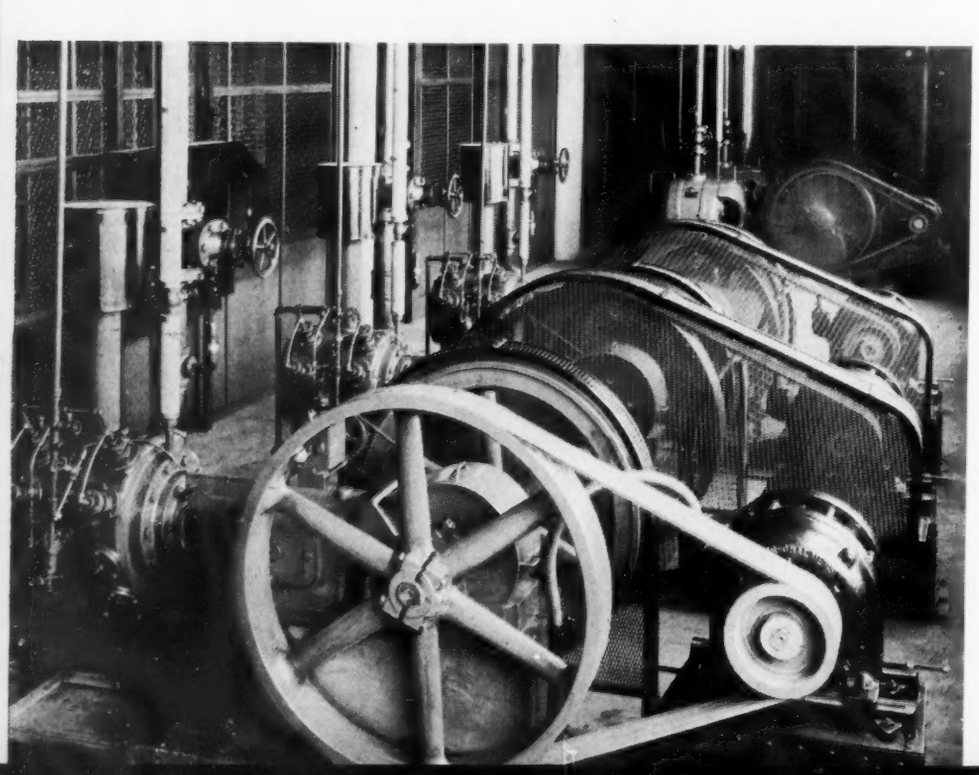
Most important advantages of standardization of group drives are the ease in installation and making changes, the decrease in amount of spare units required and the reusability when changes are necessary.

Standardization of individual control and motor drives to equipment can be carried out in connection with groups of identical machines. However, as each machine should be powered according to the characteristics and work of the machine, standardization should not be forced.

When adapting lineshaft-driven machines to individual drive, much expense is saved by designing special fixtures and attachments for mounting the motor and control. Making changes on the drafting board, until an effective and economical fixture is obtained, is less expensive than turning the task over to a mechanic or welder without any instructions.

At least two manufacturers are building special fixtures for adapting the more common types of machine tools to individual motor drive. Standardizing on use of such manufactured fixtures is an economy, especially where only a few machines of any one type are to be changed over. This saves the cost of all designing and experimental work and provides a neat and attractive mounting. Such fixtures have been used profitably where whole departments have been changed from group to individual motor drive.

Standardization is an advantage where carried out within economical and good engineering limits. Drives, however, should be engineered for the requirements, instead of trying to fit the application to a rule. Usually a sufficient number of applications can be fitted into a standardization program to be advantageous and profitable in installation, operation and maintenance.



Standardized mounting of these air compressor drives gives an attractive, neat and economical installation, including guards. Photo courtesy of Allis-Chalmers Mfg. Co., Milwaukee

Work Speeded by Torch-Iron Unit

■ HEAVY SOLDERING operations in production work are facilitated by use of a simple device which consists of an air-acetylene torch and a 6-pound soldering copper.

Shank of the soldering iron is

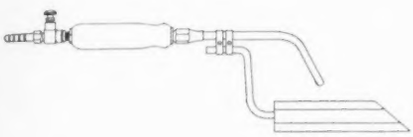


Fig. 1—An easily made device for heavy soldering operations. The 6-pound soldering copper is attached to the stem of the air-acetylene torch

bent so it can be conveniently clamped to the stem of the torch. The flame plays directly on the iron back of the tinned surface, and the size of the flame is determined by the speed of the operator. Since this unit is used generally the production work where portability of the equipment is not a factor, it is recommended that it be used in conjunction with the welding type acetylene cylinder, rather than small tank acetylene.

Production Is Doubled

Fig. 2 shows a typical operation with this soldering iron unit. It consists in soldering 25 feet of copper tubing on a small boiler for an instantaneous water heater. By means of the flame-heated soldering iron, daily production of this operation has been more than doubled. Previously, the most that one man could turn out in a day was eight heater units. Now, however, one man produces eighteen units per day regularly.

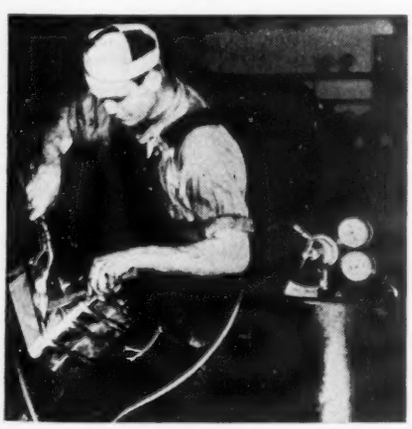


Fig. 2—The flame-heated soldering iron unit has doubled the daily production of water heater boilers. Photos courtesy Linde Air Products Co., New York

Fig. 3 illustrates another equally advantageous use of this soldering iron. The operator is soldering a copper unit which is part of a soda fountain assembly. Since this type of work requires an intensely hot iron at all times, the new iron has proved very suitable. Its continuous uniform heat has increased production considerably.

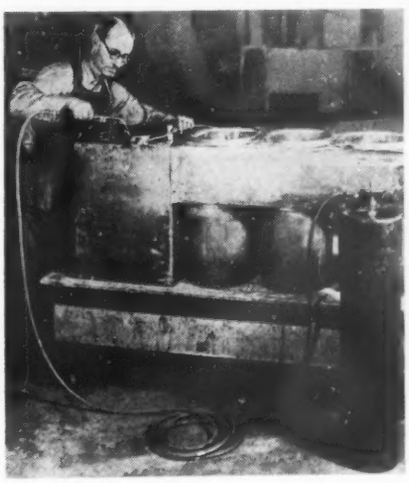


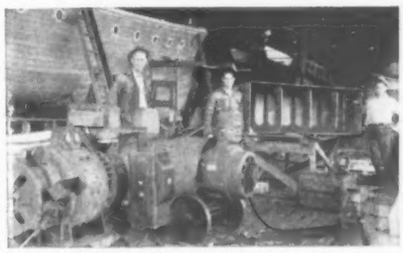
Fig. 3—The intensely hot iron speeds the soldering of this copper soda fountain unit

U. S. Specifys Welded Boats

■ OLD METHODS of U. S. cutter construction went into discard recently when Gibbs Gas Engine Co. of Florida was awarded a contract to build five 80-foot patrol boats for the United States Coast Guard fleet.

Government specifications required fuel oil tanks and other metal tanks welded, although type welding was not specified. The 2000-gallon capacity fuel tanks were to be constructed of 14-gage silicon bronze, divided into two compartments of 1000 gallons each, with necessary swash plates. The water tanks were to be constructed of 16-gage monel. In addition to the tanks, specifications called for full length X-strapping on each side of pilot house between frames and planking, to retain fore and aft rigidity—these also were required to be welded.

Using one of three 200 ampere P & H-Hansen Smootharc Welders purchased, E. L. Bouchelle, superintendent, with his field foreman, C. T. McGraw, then began to experiment with the welding of silicon bronze and monel to find the electrode that would suit their needs. It was soon discovered the average electrode would allow the parent metal to flow too quickly under the electrode arc to be practicable for use.



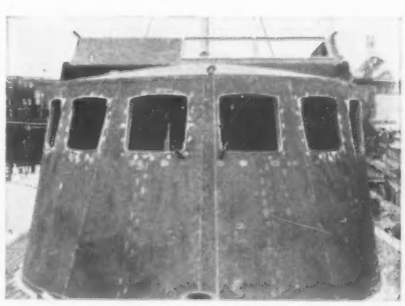
One of welders used in fabrication of cutters is seen with monel metal water tank in background

Experiments were then begun with a 5/32-inch carbon electrode carrying about 125 amperes. This amount of heat was too great, and the amperage was gradually worked down to around 65 amperes with a 5/32-inch carbon electrode and ⅛-inch filler rod of silicon bronze, where proper temperature was maintained.

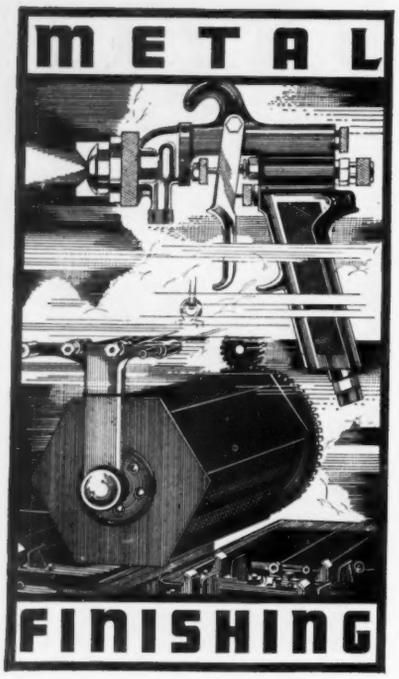
Positive Cable Grounded

Flux used was composed of borax and silicate of soda. In practice, the positive polarity cable from the welder was grounded to the work, the negative cable connected to the carbon electrode and the ⅛-inch filler rod fed into the arc with the left hand. Success of the welding depended even more upon the skill of the operator than in any other type of welded construction.

Once a method was decided upon the welding job went ahead rapidly to completion. All government tests were passed even when tanks were filled with distillate and tested with three-foot head pressure.



Pilot house is shown as completed. Seams, ports and port frames are integrally welded



Notable Economies

Three companies have merged their production lines. One fabricates the metal parts, another supplies glass and the third does the finishing. Medicine cabinets are finished inside and out at rate of one every 20 seconds

■ RECENTLY three entirely separate manufacturing companies found they were doing so much business with each other that they decided to merge their production lines. As a result, Metal Fabricating Corp., Ohio Window Glass Co., and The Japan Co. now occupy adjoining sections of the building at 5103 Lakeside avenue, Cleveland. Various types of metal and glass fabrications are made and the finish coating applied. The finishing operations are especially interesting as high production rates are obtained on many different items.

As an example, frames for aquariums made from 18-gage, cold rolled, ½-inch steel angle sections are given a coat of baking enamel with a spray gun at the rate of 100 per hour per spray booth. Medicine cabinets with door and two shelves are finished inside and out at speeds as high as 180 per hour per operator, or one in every 20 seconds.

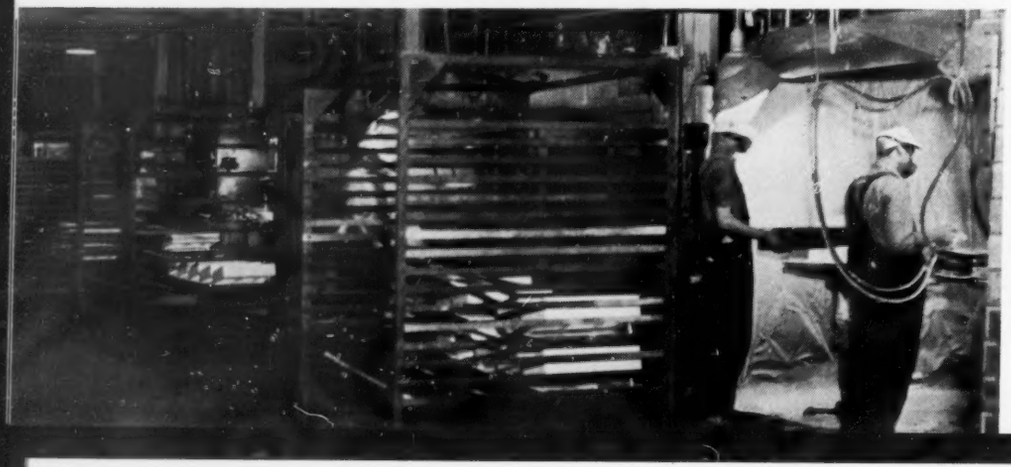
Since most of the articles produced are sold through chain stores, keen competition must be met. It was this situation that necessitated development of the high production speeds mentioned above. High quality work can be obtained at these speeds only by attuning every factor entering into the operation. One of the difficulties first encountered was that of a suitable enamel for use in the spray guns. Many enamels tried were found to run or to give insufficient coverage. After much experimentation, a specially formulated enamel that would permit high speeds in application, that would not run and yet afforded good coverage was obtained.

Another problem was the degreasing operation. This formerly was accomplished by heating the parts in an oven to vaporize and drive off dirt or grease. A temperature of 500 to 700 degrees Fahr. was employed. To speed up this operation a degreasing tank which uses a vapor solvent was installed. At ordinary temperatures the solvent lies at the bottom of the degreasing tank as a liquid. However, gas burners under the tank heat the solvent to 188 degrees Fahr. at which temperature a vapor, 4½ times heavier than air, is driven off. The height of this vapor in the tank is controlled by a water jacket and water cooled pipes mounted on the inside surfaces of the tank about 2 feet below the top. As the vapor rises it condenses on these pipes and runs back into the tank. This stabilized vapor solvent is known as Triad. Both the solvent and the degreaser are made by the Detroit Rex Products Co., Detroit.

Oil Completely Removed

In degreasing, the metal sheets, boxes, etc., are placed in racks and loaded into the tank by means of an electric hoist. As the hot vapor strikes the metal at room temperature, it condenses rapidly and flows off the surfaces carrying grease and dirt with it. After a short immersion period, the oil is completely removed and the work heated by the vapors so that condensation ceases. The work load is then taken out of the degreaser warm and thoroughly dry. Use of this degreasing operation has made it possible to clean 2000 pounds of metal per hour, a much higher production than obtained with previous methods. As most of this material is in the form of light metal sheet fabrications, this means a large volume is accommodated.

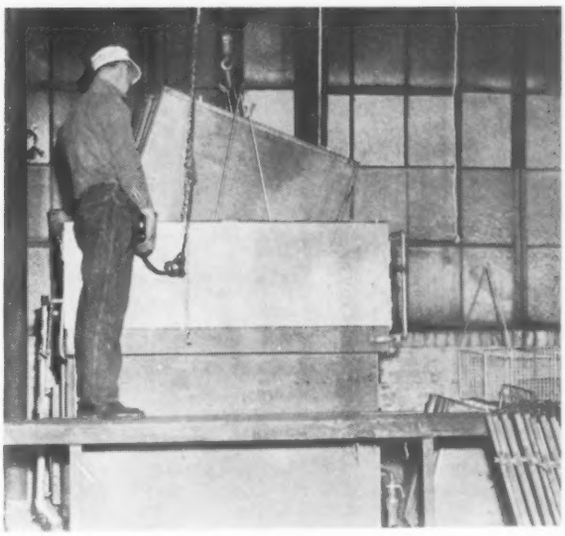
With suitable enamel and degreasing equipment, higher rates of production followed. Some difficulty was found to attend the enamel spraying operation in that the quality of the finish varied. This was overcome entirely by installation of water and oil separators of un-



Medicine cabinets receive one coat of spray enamel in these three booths, and then go to ovens for a 1-hour bake at 235 degrees Fahr.

usually large size in addition to those furnished with the valve and meter equipment accompanying the spray guns. These additional separators are about 8 inches in diameter and 3 feet long. Their use has made it possible to obtain a uniformly high grade finish at maximum speeds.

One of the most interesting items produced by the three companies mentioned is a medicine cabinet with two shelves and a door with a decorated mirror. The cabinets are made from 22-gage, single pass, steel sheets, formed and spot welded by the Metal Fabricating Corp. and painted by The Japan Co. The mirrors are made specially for these cabinets by the Ohio Window Glass Co. in the same building, are decorated by sandblasting a design on them and assembled into cabinets, these last two operations being handled by the Ohio Window Glass Co., which buys the parts from the other two companies and sells the completed product.



Degreasing metal parts at rate of 2000 pounds per hour is possible with this vapor degreasing equipment

Efficient Procedure Followed

The Japan Co. operates a night shift to take care of finish work on these cabinets, the Metal Fabricating Corp. operating a day shift to make the cabinets. High production rates are obtained by carefully worked out procedure.

Cabinets come from the degreasing operation on trucks holding one gross. Each spray booth contains two fixtures with pins to support the cabinet and lid. Sequence of operations is arranged so the spray gun operator can keep his gun going almost constantly. His helper places a cabinet on a fixture with the door on top and in the closed position. The operator sprays top of door, opens door, and sprays inside of door and inside of cabinet including both shelves. The operator then goes to the other fixture and goes through the same operations with a second cabinet. While he is painting this second cabinet, the helper places a metal pin on the door and turns the first cabinet upside down on this pin which is of sufficient length to keep the cabinet from closing. By this time the operator is done with the other cabinet and returns to the first cabinet to paint it on the outside as it lies in the partially closed, upside down position.

During this time the helper positions the second cabinet for the outside spray. Then while the operator finishes this cabinet the helper removes the first one, places it on a loading rack and sets an unpainted cabinet in position. The sequence of operations is arranged so that the spray gun operator does no positioning or loading of the cabinets except to open the cabinet door in the first operation which is done without stopping the gun. As there are always unpainted surfaces waiting, the spray gun can be operated continuously making for maximum production.

The helper's work in loading and unloading the fixtures is timed to supplement the corresponding work done by the operator so the helper works continuously without any unproductive periods. During the first hour, each operator and helper turns out around 180 cabinets. Subsequently, fatigue lowers the production rate but the men average above 100 per hour for the entire shift.

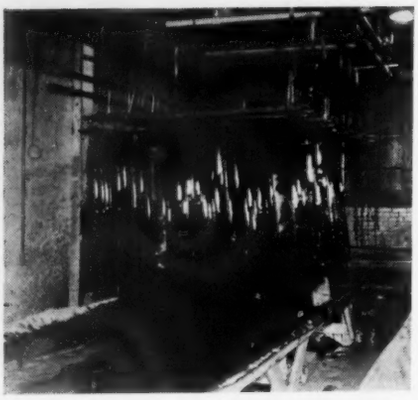
After spraying, cabinets are loaded into racks which are run into one of two large bake ovens, each 21 feet long and capable of holding three large racks. Here they receive a 1-hour bake at 235 degrees Fahr. These ovens are of the gas fired, radiant tube type with blowers to circulate air inside them for uniform temperature throughout the load and with automatic recording pyrometer temperature control capable of maintaining a constant temperature within 2 degrees plus or minus. This extremely accurate temperature control is essential to produce uniform shades of color. Other products utilize various types of enamels so an oven temperature range of 180 to 500 degrees Fahr. is provided.

Another interesting assembly on which high production is obtained consists of gasoline station display signs having six parts. The panel is 18-gage steel sheet, the frame 1-inch T-section iron and the supports 2 x 2 x 2-inch U-channels. These are dipped in japan, hung on monorails over a drip pan and oven baked at 450 to 500 degrees Fahr. at the rate of 500 signs or 3000 pieces per day, using two dip tanks, two drip pans and two ovens.

Colors On Separate Parts

In finishing clothes hampers, three colors are provided without interrupting production by making the hamper in three pieces, the hinged top, spot welded side section and formed bottom section. Each piece is given its distinctive color by spray or dip as required and assembled to give the 3-color product. Lids are fastened to the hampers by extension lips which are bent around a wire rolled in the top of the hamper to form the hinges. The bottom, or end section, is formed to fit part way into the hamper section where it is fastened with small rivets. The side sections are made from 22-gage, single pass, steel sheet. Usual production is

Fixture set-up in spray booth helps finish 180 medicine cabinets per hour. Cabinets are completely finished, inside and out, with single spray coat



Here overhead monorails facilitate draining after diping metal parts in japan tank at far end of lines

1000 per 8-hour shift using three spray booths.

Modernistic tubular frame steel chairs are made in three pieces, frame, back and seat. Frames are dipped in japan. Backs and seats are sprayed, a production of 1200 pairs per 8-hour shift being obtained with two spray booths. Three fixtures are utilized to speed up this work.

A new item attracting wide attention is the "Pooch Bar" for the family dog. It is a metal frame with suction cups on the feet and with two glass containers for food and drink. The metal frames are 20-gage, hot-rolled, pickled, steel sheet. These are given a synthetic wrinkle finish sprayed on at the rate of 1000 in eight hours in one booth, and subsequently oven baked.

Anodic Treating Fully Automatic

■ Hanson-Van Winkle-Munning Co., Matawan, N. J., recently completed the first two units of an order for eight motor-generator sets to be used in the anodic treatment of aluminum parts. These sets are larger than those ordinarily used and fully automatic control equipment is employed to vary generator voltage through a predetermined cycle of values as required for the specified treatment of a batch of aluminum parts. Control panel includes regular indicating instruments and equipment for visual and manual control. The automatic equipment consists essentially of a motor-driven field rheostat and timer.

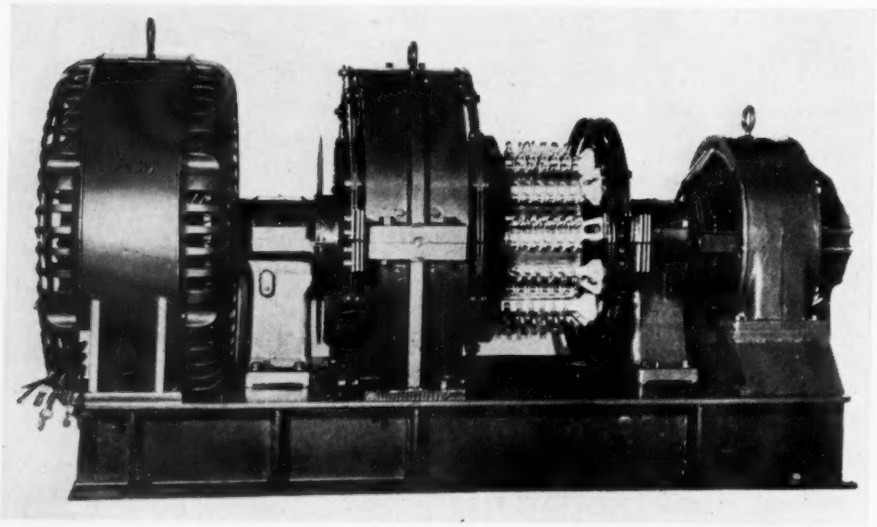
Parts Hung in Bath

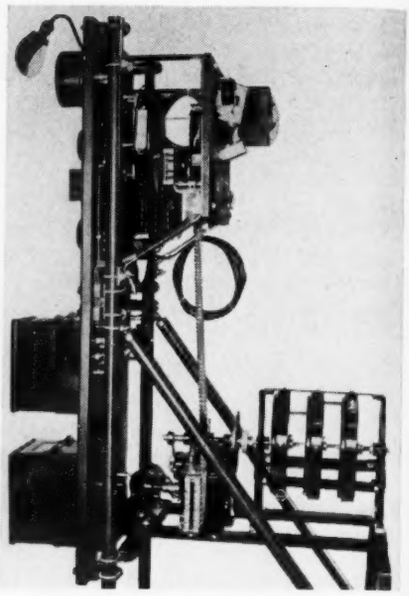
For normal operation, parts to be anodized are cleaned and hung in anodizing bath. The operator then simply presses a button to set the automatic control in operation. The motor-driven field rheostat increases generator voltage from 5 to 40 volts in 8 minutes. On completion of this 8-minute treatment, the rheostat comes to rest and a synchronous timer starts to operate. Generator voltage is held at 40 volts until the timer completes its operation, normally 30 minutes but adjustable from 1 to 36 minutes, at which time the generator field circuit is opened and a warning signal announces to the operator that the treatment cycle has been completed. Control automatically resets to its starting position.

During the treatment cycle the voltage and current are recorded by graphic meters on strip charts dated and numbered to correspond with the batch number of the parts treated. These charts plus a similar temperature chart and a record of the solution analysis constitute a complete record of the treatment of each batch and give evidence that the treatment was in accordance with specification.

In case of a short circuit in the anodizing tank or an overload from any cause, generator voltage is automatically reduced to protect the equipment from injury. It is restored immediately upon removal of the overload.

Motor-generator set for anodic treatment of aluminum parts is rated 1500 amperes, 50 volts, 125 horsepower





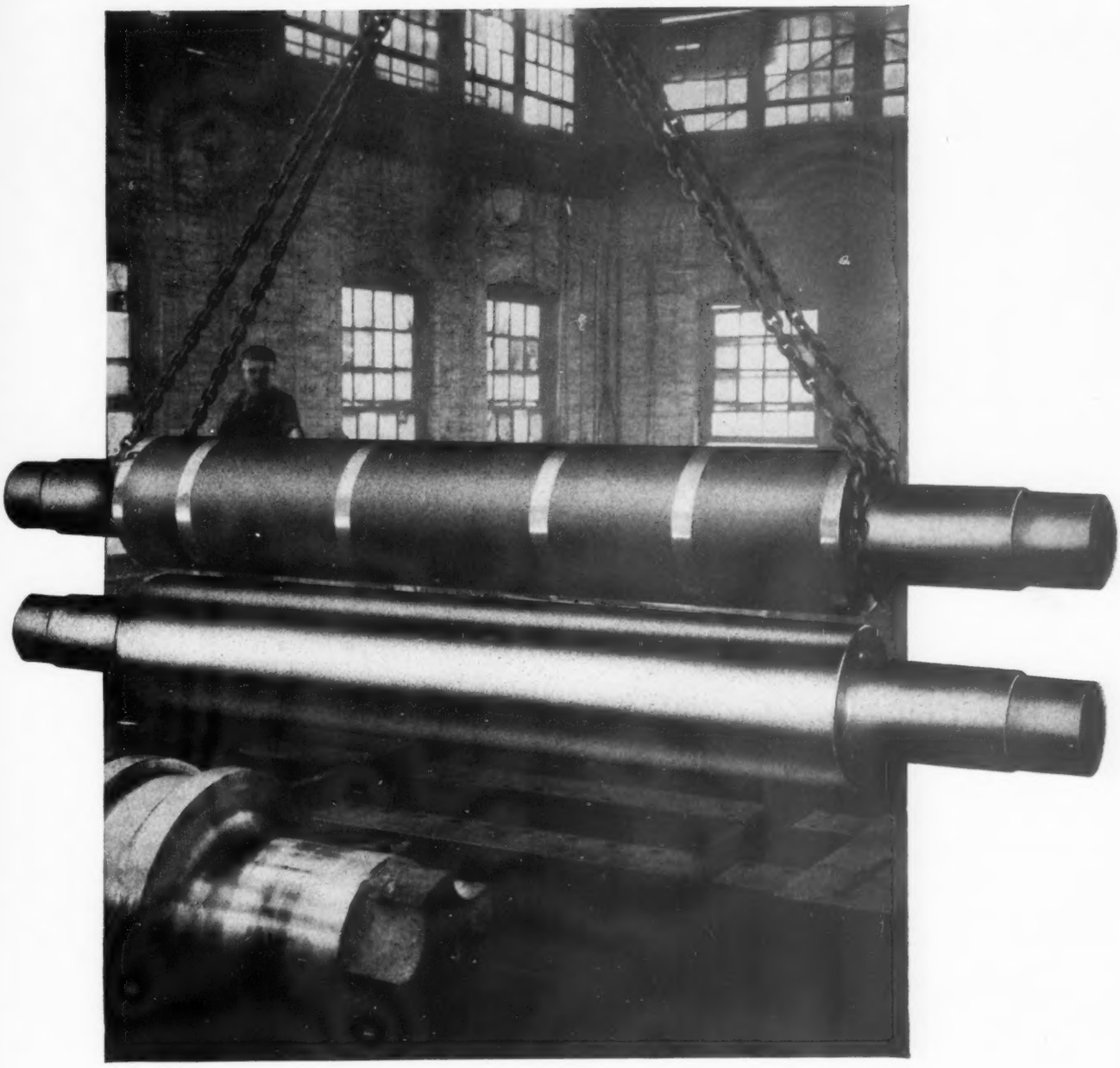
Side and rear view of control equipment which puts aluminum parts through an anodizing cycle automatically

Develops Aluminum Plating Process

■ William J. Travers, Buffalo, has been granted a patent on a process for plating aluminum and aluminum alloys. Chief among the features claimed for the process is that the plating may be applied successfully by practical platers after brief instructions and with ordinary plating equipment.

The process is initiated by establishing a thin anodic film over the surface of the article, using a mild acid bath with low current density. Film then is modified in an alkaline solution after which the article may be plated in the manner of all common metals using the same equipment, ordinary current density and time values.

This new development, called the Chrome-Alume process, can be used to cover aluminum with any of the common metals, it is said. In addition to automotive parts, the process has been applied to household utensils. Aluminum die casting manufacturers in some cases are reported as contemplating its use on cast parts for trim in exposed positions.



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By ROBERT E. KINKEAD

On this page the author, well-known consulting engineer in welding is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL

Competition Keen In Welding Field

■ Newcomers in the welding field are struck with the relentless energy with which its competitive struggles are waged.

Our own opinion is that all fields where there is unrestricted competition will show the same condition. Often men in the welding industry will fight out a competitive battle with full knowledge the costs of the fight will mean they both lose money. These battles, and there are many of them, stop just short of actual physical violence. To say that competitors in the welding field do not really mean it and are all good fellows among each other after working hours is to display complete ignorance of the realities. These competitors cordially dislike each other.

But it seems that human progress must come, to a considerable extent, from the struggles of men who are aroused to an emotional pitch which necessitates decisive action. Angry and determined men get things done.

All of the politician's talk about the evils of monopoly leaves the industrial leaders of the country cold. They know more evils than the politicians have named or even thought of. Monopoly, in the view of present day industrialists, is an evil to be tolerated only when there is no other way—as, for instance, the case of a unified national telephone system. The problems of managing what is called big business are already so severe that no one wants to invite the insidious destruction that usually comes with monopoly.

The feeling in the welding industry was well expressed by a capable executive whom we questioned as to his reason for spending so much money he would never get back fighting his competitor on a job that meant little to either of them. His answer was: "What if it does cost me some money to lick those so and so's? It's a swell fight and we'll both learn something!"

Cost Less to Weld

■ Welding of the low alloy welding steels, which have been widely advertised during the last year, has presented no problem, since they were developed to be easily welded.

But there is greater significance in the welding of these double strength steels, as only about half the thickness is required in many cases. An illustration may be taken in the case of a structure made of ½-inch thick carbon steel where the plate is to be butt welded by the arc process. In the double strength steels, ¼-inch or possibly 5/16-inch thick steel would be used for tension loading.

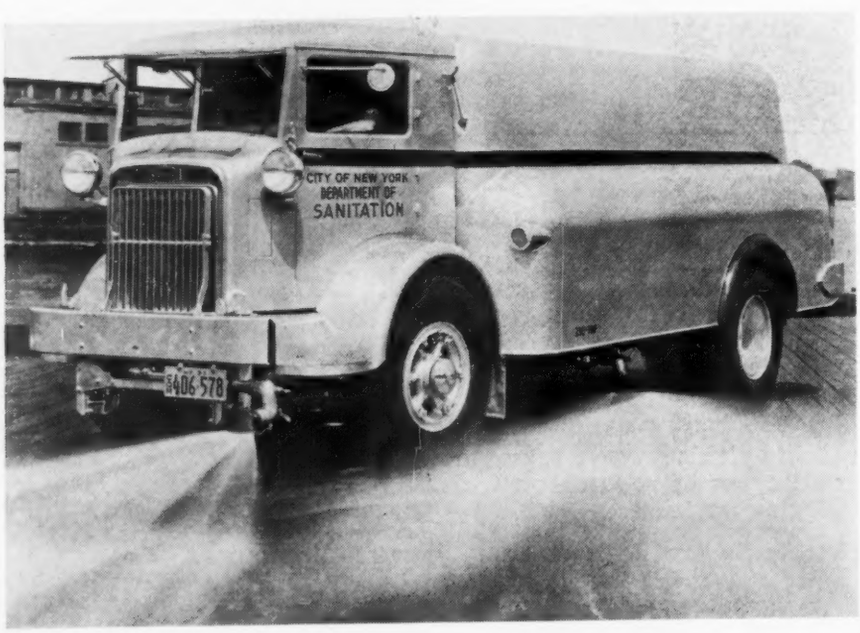
In the latter case, the edges would be butted together and the weld made from both sides with no regular kerf provided. But if the single strength carbon steel were used, the edges would be prepared for a kerf at a considerable cost and from three to four times the amount of weld metal would have to be deposited. Thus, the welding cost of using single strength steel might well be four times the welding cost of using double strength steel. Since welding cost is usually equal to or greater than the cost of the material it is an item which may not be easily neglected.

•

No New Principles

■ In the article "Science and Technology Is Way to Human Progress," which appeared on this page last week, the sentence referring to Mr. Roosevelt and his administration should have read: "Whether one chooses to call them statesmen or politicians, they have contributed *no* new principles to the art of government." Omission of the word 'no,' Mr. Kinkead states, "takes all the sense out of the article."

Truck Is Clothed in Steel



■ **Clothed in steel, the streamlined street flushing truck shown is one of 75 purchased by New York city sanitation dept. from Heil Co., Milwaukee. Body is of sheet steel furnished by Bethlehem Steel Co. Water tank is completely covered and streamlined to suit contours of chassis. Carrying out the streamline motif, the rear is curved downward in a beaver-tail design, and fitted with two doors to facilitate pump inspection. Welding is used throughout the construction**

ADVANCE YOURSELF BY PUSHING WELDED DESIGN FOR PROFITS

USING standard rolled steel plates and shapes, cut to size, the manufacturer of this take-up stand for a crawler shovel is producing the welded design at a saving of $60.54. Of the former construction shown, the stand cost $139.14. Factory cost of the welded steel stand is only $78.60. Weight was cut more than 33%.

By pushing changeover to welded steel construction you are bound to contribute to the prosperity of your company. Make this your key to advancement in position and increased earning power.

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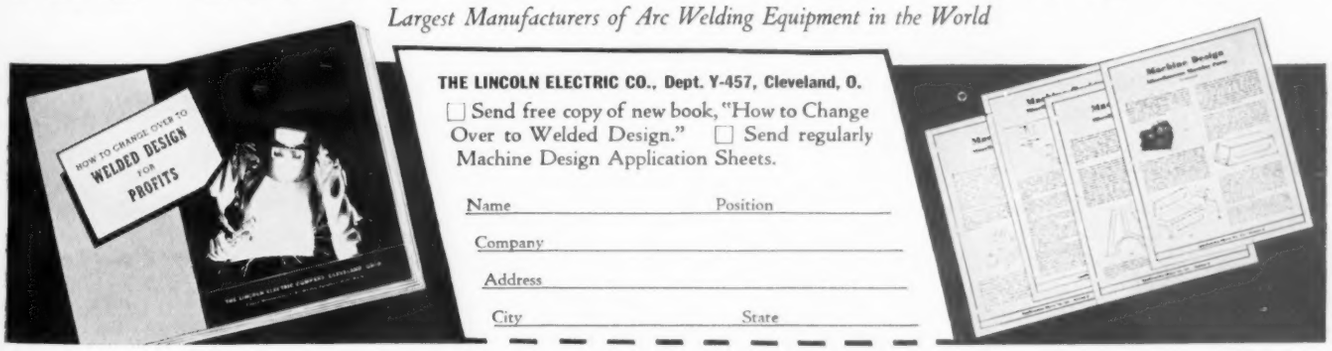
Largest Manufacturers of Arc Welding Equipment in the World


HOW TO CHANGE OVER TO
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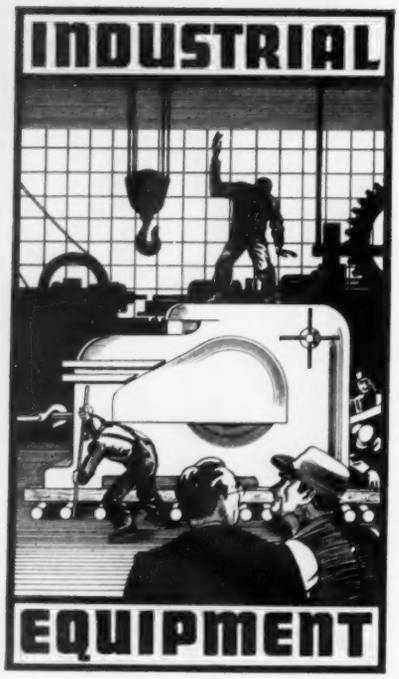


Lift Truck Is Used To Handle Pallets

■ Lyons Iron Works, Greene, N. Y., has introduced a pallet lift truck which is designed to handle both single or double faced pallets when a power truck is not available.

Openings must be made in the bottom face of the pallets by spreading the boards wide enough to accommodate truck wheels. Lift truck can then be pushed into the pallet, and when fully entered, rear wheels will drop through the rear opening of the pallet and contact the floor. By means of a hydraulic elevating mechanism, operated by pumping the truck handle, the truck is elevated, lifting the pallet off the floor without interference with the bottom boards due to the single frame construction of the elevating platform of the truck.

Two sets of rollers mounted on the rear of the U-shaped platform of the truck facilitate the entrance of the truck into the pallet by raising the rear end of the truck frame when they contact the bottom boards allowing wheels to enter easily.

Lift truck is designed for use with pallets 48 inches long by 36 inches wide with end boards 6 inches wide and a minimum opening of 6½ inches. Frame side bars are made of high carbon steel. The two front wheels are equipped with Timken roller bearings and are 7 inches in diameter with a 2-inch face. The four rear wheels are 3¼ inches in diameter with a 3-inch face.

Lyons lift truck has a 4000 pound capacity and can be lowered 3¼ inches or elevated 3 inches. U-shaped carrying platform has an overall length of 48 inches including rollers

Reversible Ratchet Is Fully Enclosed

■ Bonney Forge & Tool Works, Allentown, Pa., has placed on the market a reversible ratchet with a handle for ⅜-inch, square drive sockets and attachments.

Ratchet is light in weight and fully enclosed to keep out all dust, grit and grease. The ⅜-inch lug makes it adaptable for use with all ⅜-inch, square drive sockets and attachments. On the other side of the head is a ¼-inch square opening for use with the same sized adaptors or for use on small compressors, motors and shut-off valves.

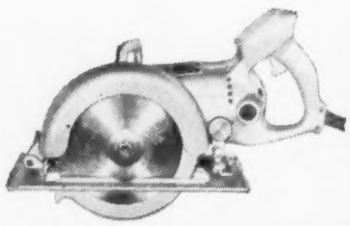
Tool is made of CV chrome-vanadium steel, chromium plated and highly polished. It has a round knurled handle which insures a firm, comfortable grip.

Electric Saw Is Compact

■ Black & Decker Mfg. Co., Towson, Md., is announcing a new 7-inch portable electric saw which has been reduced in weight and length through a close-coupled design, and has a maximum depth cut of 2⅜ inches.

Motor power of unit has been increased and is transmitted by worm gears to the blade. Cool motor operation is assured by ventilation supplied by a fan and vent slots. Saw table may be tilted for angle or bevel cutting and locked at any angle from 0 to 45 degrees. Unit is provided with a detachable, adjustable, rip-fence, which measures and guides rip-cutting up to 6 inches wide. A notch in front of saw table makes it easy to follow pencil marks or other guides.

Various blades and abrasive disks are available, adapting this unit to rip-sawing, cross cutting, metal cutting, slotting marble, asbestos, transite, tile and porcelain. Telescoping guard covers the blade at all times except when actually cutting. Inner guard, mounted on ball bearings, opens as saw advances into the work, and springs close it the instant cut is finished. Outer guard swivels on spindle housing to follow depth-of-cut adjustment. A 2-pole release switch mounted inside the unit's grip handle avoids accidental turning on and cuts off immediately as the operator's grasp is released.



Black & Decker electric saw has a 2-pole, instant release switch mounted inside the grip to avoid accidental operation

Industrial Spotlight Casts Much Light

■ Benjamin Electric Mfg. Co., Des Plaines, Ill., has placed on the market an industrial spotlight capable of high intensity illumination at tool point of machines or over small areas of work benches.

Light values approximating 1000 foot candles can be built up over restricted areas of vertical or horizontal surfaces due to the angular adjustment feature which is an integral part of the design. Glare is reduced to a minimum through the use of dead black, internal louveres which are removable when a less highly concentrated beam is desired.

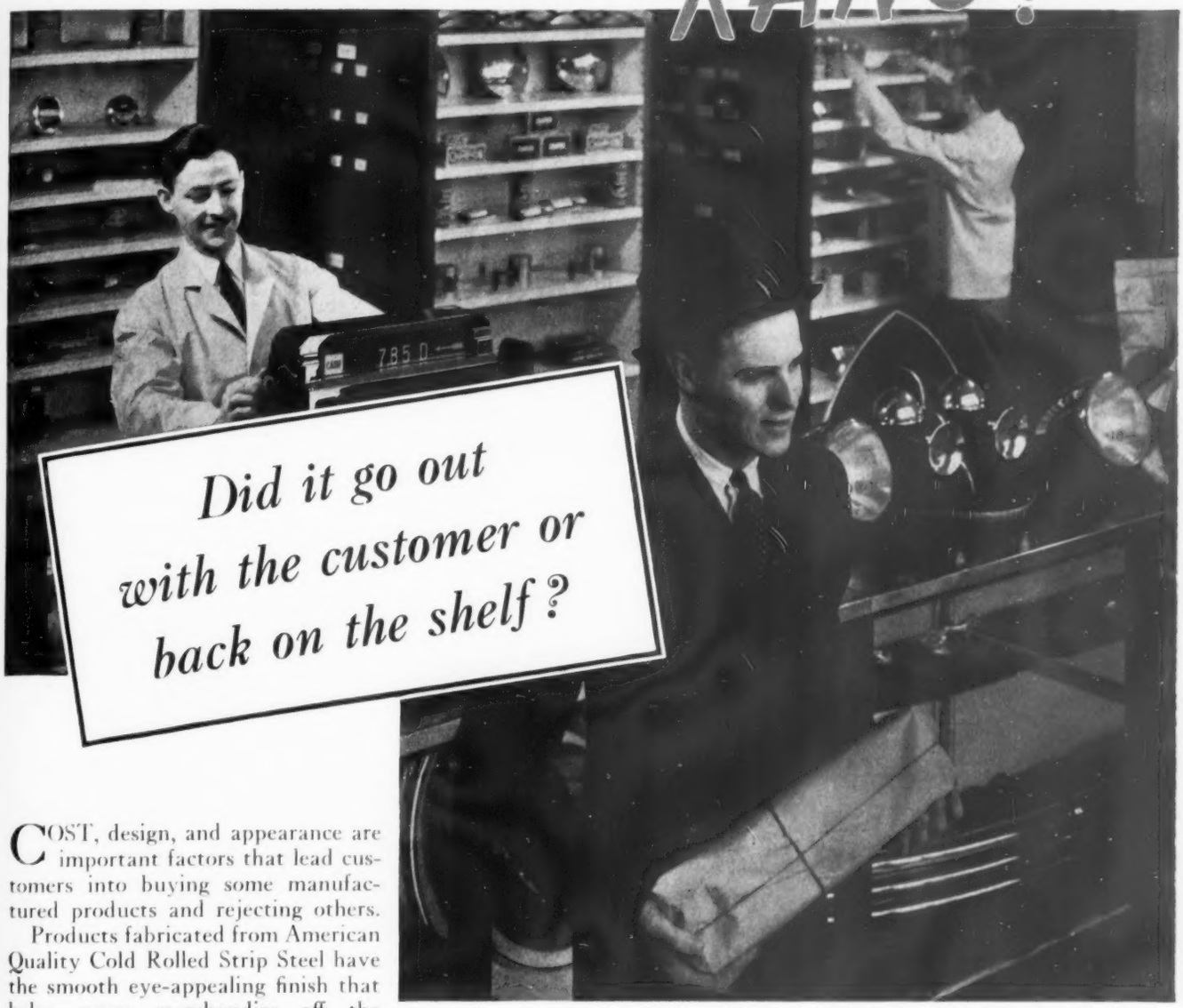
Where color correction is desired, a daylight glass cover is employed, giving a color temperature of 4200 degrees Kelvin. The intensifiers are recommended for such service as fine assembly and inspection work, die surfaces, overhanging machines, for engraving, tool making and illuminating the inside of ovens and processing machinery.

Spotlights are available in adjustable focus types from 60 to 200 watts using medium base lamps, and in fixed focus, 300 to 500 watt mogul base types. They are supplied with brackets tapped for ½ or ¾-inch conduit. All of the models have polished aluminum alloy reflectors, externally finished in green lacquer.

Truck Lifts Objects

■ Smith Devices, 2245 North Twelfth street, Philadelphia, has introduced a redesigned line of steel and electric welded trucks which are said to lift, tilt and easily handle objects which are ordinarily hard

WHERE WAS YOUR PRODUCT WHEN THE CASH REGISTER RANG?



COST, design, and appearance are important factors that lead customers into buying some manufactured products and rejecting others.

Products fabricated from American Quality Cold Rolled Strip Steel have the smooth eye-appealing finish that helps move merchandise off the dealers' shelves and counters. It helps keep prices within the range of your customers' pocketbooks, too. For its cost is much lower than some of the more expensive metals. The ease with which it can be fabricated will reduce your rejections and wasted metal to a minimum.

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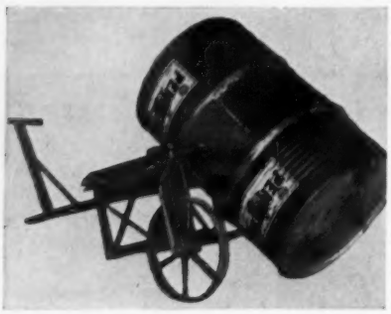
UNITED STATES STEEL

to handle with an ordinary hand truck.

Trucks have 16 and 20-inch diameter ball bearing steel wheels and



Smith hand truck is fabricated of steel and electric welded. It can be used to empty drums and barrels into vats and tanks

roll easily with the load. Illustrated truck will pick a drum up from the flat and upend it. Drum can be turned in the truck for emptying. The truck has a safety grip to prevent dropping the drum while it is draining. Same truck with combination hookup will handle barrels and boxes.

Coal Crusher Can Be Regulated

■ Link-Belt Co., 307 North Michigan avenue, Chicago, has placed on the market a 2-roll spring-relief coal crusher which is known as chain drive type C.

A feature of the coal crusher is the use of cut tooth wheels and Silverlink roller chain for forming the driving connection to both rolls from crusher countershaft, which is mounted in antifriction bearings. Roll shafts are carried in heavy rigid bearings, with one shaft adjustable to vary the size of the product or to compensate for wear. Adjusting sleeves are provided with relief springs as a protection against excessive stresses, and any shock from these springs is transmitted directly to the welded frame.

Rolls are of the segmental type, having cast iron spiders to which are bolted heavy alloy iron segments, heat treated to a hardness of 500 to 600 Brinell. Segments can be easily taken out without removing the side housing.

Other features include compact design, unbreakable all-welded framework, smooth, quiet operation and low maintenance cost. According to tests and actual service, the unit has shown that more accurate sizing of the product is possible, and also smaller fly wheels and higher speed motors can be employed.

Equipment Allows Better Welding Job

■ Welding Engineering Co., 2872 North Forty-First street, Milwaukee, has placed on the market two developments in the welding field. One is a fiber helmet designed to give the operator more ventilation, and the other is a flexible welding cable which allows more freedom during welding operations.

Helmet is light in weight, weighing about 1 pound. Its sides are brought close to the head to protect from flashes of other operators. Headgear is fitted so helmet will rest back on the head, allowing for work inspection. A quick nod brings helmet back into position, allowing both hands free to work.

Flexible welding cable has a thick coating of 60 per cent Para rubber strengthened by a braid of cabled cotton. This is said to make the cable elastic and waterproof. Flexibility of cable lessens the strain on operator and allows more freedom to work, it is claimed.

Wrenches Are Longer

■ J. H. Williams & Co., 75 Spring street, New York, has placed on the market three new double-head, double offset, 12-point box Superwrenches to its line. Wrenches are designed for heavy service. They range in length from 23 to 27 inches with openings from 1 7/16 to 2¾ inches.

Wrenches are strongly built and designed to permit work in close quarters. Much leverage is obtained by their extra length. They can completely rotate a hex nut where the swing of the wrench is limited to 30 degrees, less than 1/10 of a full turn. These tools are forged from a chrome-molybdenum steel, heat treated and finished in chromium.

Motor Is Mounted On Drill Spindle

■ Edlund Machinery Co., Cortland, N. Y., has placed on the market a drilling machine which has the motor mounted directly on the spindle to operate it at speeds from 600 to 3600 revolutions per minute.

Machine comes in sizes having an overhang of 8, 12 or 15 inches. Eight spindles can be provided, each equipped with ball bearing back gear, semi-automatic power feed, reversing motor and controls for tapping, and equipment for supplying coolant to the work and spindles.

Speeds are selected on the unit by turning a knob in front of the machine. A dial indicates the speed being attained. The semi-automatic power feed engages when the drill touches the work. By raising the feed lever, the feed cam can be disengaged. A dial also controls the depth of the feed cam.

Machines with multiple spindles can have each of its motors stopped

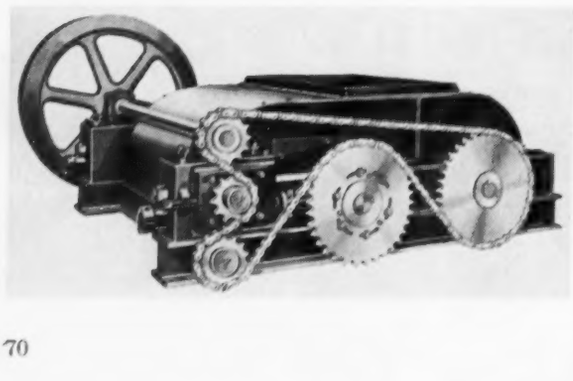
This Edlund drill which has a motor mounted directly on the spindle can attain speeds between 600 to 3600 revolutions per minute. Eight spindles can be provided with this unit

individually by means of a drum control or it can be stopped entirely by applying a foot control.

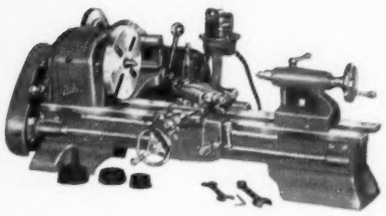
Small Parts Are Machined on Lathe

■ Atlas Press Co., Kalamazoo, Mich., has introduced a back-geared, screw-cutting lathe which is used for small part machining and swings diameters up to 6 inches.

Lathe is built in two bed lengths



Roll shafts of this Link - Belt coal crusher are carried in heavy rigid bearings with one shaft adjustable to vary size of product



Atlas 6-inch back-geared lathe has reversible power feeds and 16 speeds between 54 and 3225 revolutions per minute

with a 12 or 18-inch capacity between centers. Thread cutting range is 8 to 96 threads per inch, right or left hand. Built-in adjustable countershaft is attached directly to the lathe. Unit is powered by a V-belt drive from motor to countershaft to spindle. Headstock spindle is machined from a solid bar of steel, ground and polished. Unit is equipped with Timken tapered roller bearings which provide a minimum of friction for radial and thrust loads.

Carriage bearings, tailstock bearing, and cross slide and tool post slide dovetails have gibs or laminated shims to take up adjustment and maintain accuracy. Headstock, bed, legs, carriage, compound rest, tailstock, gear guards, countershaft support and switch bracket are heavy, gray iron castings. Other small parts are fabricated of Zamak, a rugged, metal alloy. The lathe has 16 speeds between 54 and 3225 revolutions per minute.

Cement Is Applied By Pneumatic Hose

■ Concretor Co., Franklin & East streets, Elkhart, Ind., has introduced a Concretor which pneumatically applies concrete, refractory and other materials in coatings several inches thick of any desired consistency.

In the application cement and aggregate, mixed dry, are blown through a hose to the nozzle where water from a separate hose is added in the mixing chamber. Hydration is made with less than 4 gallons of water per sack of cement. No excess water for lubrication is necessary.

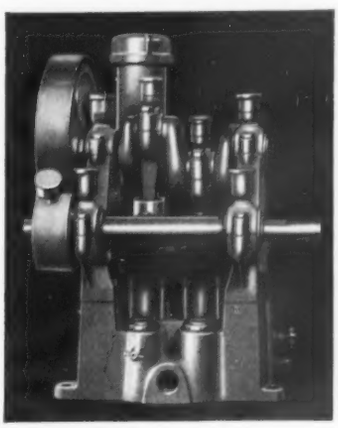
Concretor is made in 3 sizes. Type D is suitable for any kind of pneumatic application work. Type R is for light work and type F for very large capacities. The two former types are made in either single or double chamber models. Single chamber models must be shut down to reload and thus operate intermittently. Double chamber models operate continuously, the lower chamber containing a reserve to feed out while upper chamber is refilled.

Material is introduced as through an air lock, passing through one valve and then another so lower chamber is always under pressure and feeding material.

All Concretors can be furnished with either air, electric or gasoline motors. Nozzle can be taken apart by hand and very easily cleaned. Chrome steel bell valves seat on oversize rubber seals. Stainless steel feed-wheel prevents adherence of material in pockets. Bronze and heavy, precision ground, hardened steel worm gears are sealed in oil. Grease fittings are provided for the ball shaft.

Light Duty Pump Fabricated for Spraying

■ Hardie Mfg. Co., Hudson, Mich., has placed on the market a light duty, high pressure No. 99 pump for spraying purposes. The pump



This Hardie spray pump delivers 4 gallons of water per minute when operating under 300 pounds pressure per square inch

embodies all the design and construction features of the larger pumps.

When operating at slow speed, 120 revolutions per minute, pump delivers 4 gallons of water or spray liquid per minute at 300 pounds pressure per square inch. Features of the pump include clean oil lubrication for every moving part including plunger, plunger cylinder on plunger cup, heavy forged crankshaft, large replaceable bearings, stainless steel gasketless valves, standard built-in pressure regulator and air chamber.

Differential Control Increases Counter Speed

■ United Cinephone Corp., 43 Thirty-third street at Queens boulevard, Long Island City, N. Y., has developed a ratio differential control which multiplies the speed of a mechanical counter, depending on the desired ratio of counting to counter speed.

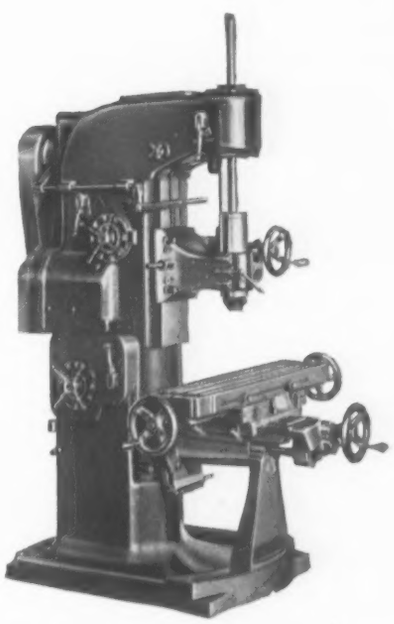
Device does not depend upon impulse charging of a condenser but furnishes one impulse to the final counter circuit for a definite number of interruptions of the light beam. Ratio, it is claimed, is accurate and unchanging.

A frequent reason for inaccuracies of mechanical counters as their limited counting speed is approached is the decrease in the length of time counter is energized or deenergized. With the ratio differential control, counter is energized and deenergized just 50 per cent of the time regardless of the percentage of time the beam is interrupted. Standard scale-of-two control supplied with Veeder-Root reset counter will safely count up to 5000 per minute.

Difficult Parts Are Machined on One Unit

■ W. B. Knight Machinery Co., St. Louis, has placed on the market a No. 30 milling machine which not only is capable of doing a wide range of plain milling and boring but also machines difficult and unusual parts without special equipment.

Heavily reinforced steel column of this machine is cast integral and supports the table and spindle units. The forged chrome nickel steel spindle is driven by hardened ground and lapped spiral bevel gears insuring both rigid transmission of power and a smooth drive. Heat treated alloy steel change



Knight No. 30 milling machine has sixteen spindle speeds in geometrical progression from 80 to 1600 revolutions per minute

gears are mounted on antifriction bearings and run in oil. Table unit is of a semi-bed type being supported at the outer end of the knee as well as at the column. Table is tilted by work screw with graduations indicating degree of tilt, and may be adjusted to either side of the horizontal plane for angle milling. It may also be kept square with the spindle at all times by adjusting the eccentric bushing in the outer table support. To increase both the longitudinal and throat range it is possible for table unit to swivel around the column.

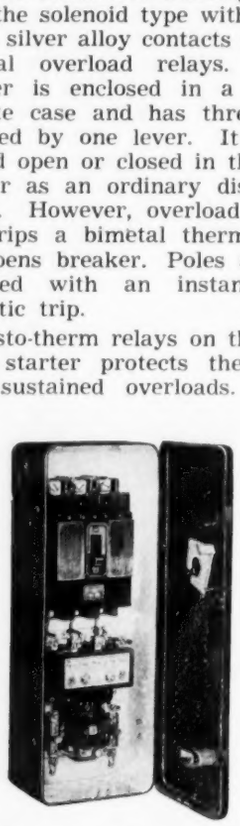
Machine is driven by a short V-belt drive to a twin disc clutch. Brake is operated by disengaging the clutch. When this is done spindle stops immediately. Positive and automatic throwouts are provided for spindle feed in either direction. Tool changes are made at the spindle nose. Unit is also equipped with dials for selecting speeds and feeds.

Combination Starter Uses Circuit Breakers

■ Allen-Bradley Co., 1113 South First street, Milwaukee, has introduced a combination starter utilizing circuit breakers. It is available with either a maximum rating of 30 horsepower, 220 volts, or 50 horsepower, 440 to 450 volts.

Unit consists of a hand-operated disconnect switch and an automatic starter. Disconnect switch of this unit has been replaced by circuit breakers. Automatic starting switch is of the solenoid type with double break, silver alloy contacts and two thermal overload relays. Circuit breaker is enclosed in a molded bakelite case and has three poles operated by one lever. It can be tripped open or closed in the same manner as an ordinary disconnect switch. However, overload in any pole trips a bimetal thermal unit and opens breaker. Poles are also equipped with an instantaneous magnetic trip.

Resisto-therm relays on the automatic starter protects the motor from sustained overloads. Short circuit protection is also provided with bimetal and magnetic trips on the circuit breaker.



This Allen-Bradley combination starting switch with circuit breakers has a hand-operated disconnect switch and an automatic starter

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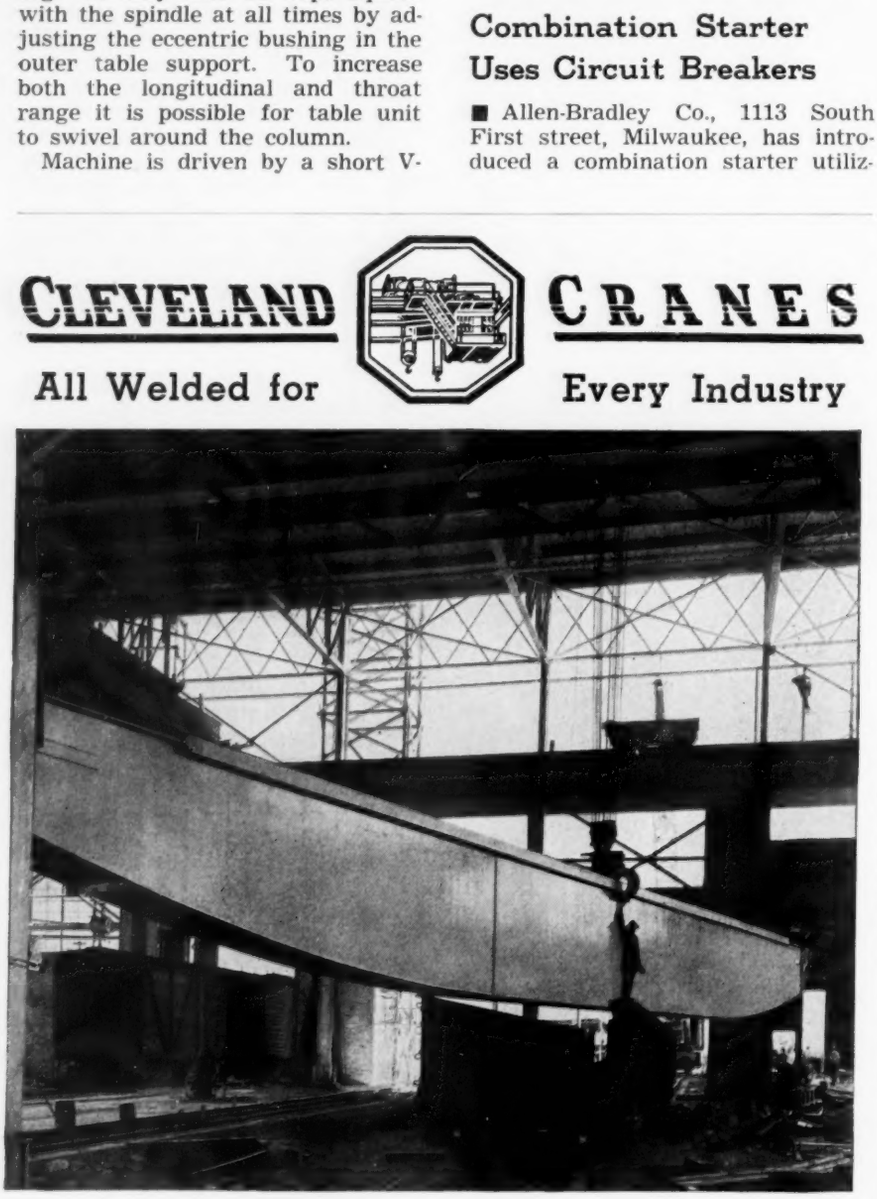

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MATERIALS HANDLING EQUIPMENT

Improves Steel Chain

■ Designed for use where high tensile strength is required from light weight material, Stro-Lite, hand made steel chain, has been improved by its manufacturer, Carroll Chain Co., Columbus, O.

This chain has each link expertly welded and entire length specially heat treated, with a soft core and hard surface to give long wear. For comfortable handling, it is highly polished. Nominal sizes range from the 7/32-inch chain with 15 links per foot and weight of 55 pounds per hundred feet, to the 1-inch chain with 5 links per foot and weight of 1050 pounds per hundred feet. Sizes larger than 9/16-inch are self-colored or blacked.

New Tires for Industrial Tractors and Trailers

(*Concluded from Page 52*)

dinary tires to become soft and spongy, and under such conditions tires are susceptible to rapid tread wear, cutting and chipping.

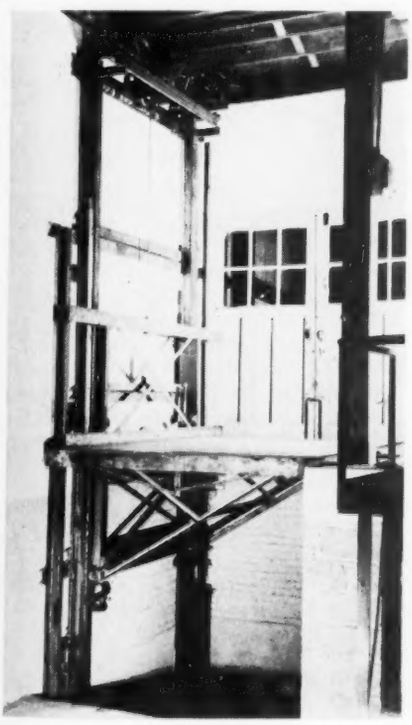
New System Benefits

■ Recent installation of a complete materials handling system in a mid-western plant that manufactures automotive products is reported to have resulted in larger returns to both employer and employes. As a result of reduction of waste, better quality merchandise has been made possible, with higher wages and lower cost—typical of what well designed and properly applied materials handling equipment accomplishes.

One Story Elevator

■ Various types of elevators, some stationary and others portable, have been utilized in the past to aid handling of materials between floors in manufacturing and mercantile establishments. Recently an installation was made of a new type for lifts up to approximately 12 feet with capacity up to 5000 pounds. Platform is 78 by 118 inches and requires a shaftway of only 90 x 120 inches. Rails, cables, anchorage and counterweights take up only 11 inches along one side while elevator machinery is located overhead.

One important feature is that all three sides of the car are available for openings. Doors open on a loading platform while two levels inside the building are also served. Construction of guides and supports is such that they can be removed readily and set up at a new location of similar dimensions. Instantaneous self-aligning type safeties act in the event any of the cables break.



New freight elevator provides access on three sides. Photo courtesy Revolvator Co., Jersey City, N. J.

Use Hydraulic Lifts

■ Hydraulic lifts for raising industrial trucks and skid loads to the level of motor truck tailboards are becoming more common in manufacturing plants. In one New England plant, such a lift is located in the center of the shipping room floor. In a nearby plant, the lift is installed in a section of the truck loading platform in the rear of the shipping department.

Use Plastic on Gages

■ Newest Multi-Pointer gages and boiler meters manufactured by Bailey Meter Co., Cleveland, are equipped with indicating scales of ivory Plaskon. Advantage has been taken of the translucent qualities of the plastic and the gages are now illuminated.

Diffusion of light through the scale sharply outlines the instructions which have been engraved in black, facilitating reading in dark boiler rooms. With the new plastic, scale faces have been set on the same plane and an offset effect has been provided.

Howe Lecture on Cast Iron in Reprint Form

■ International Nickel Co. Inc., 67 Wall street, New York, has prepared reprints of the Henry Marion Howe memorial lecture on "Progress in Improvement of Cast Iron and Use of Alloys in Iron," which Paul D. Merica, vice president of the company, presented before annual meeting of the American Institute of Mining and Metallurgical Engineers in 1937.

Dr. Merica reviewed the remarkable improvements of recent years in cast iron, the development having followed the lines established by steel, namely, control of the processes of production, extensive uses of alloys, and, more recently, perfection of sound heat treatment practices.

Present widespread use of nickel cast irons for camshafts and crankshafts of gasoline and diesel engines, as well as for gears, cams, dies and other applications where strength, toughness and wear resistance of a high order are required, constitutes impressive evidence of the progress made, it is pointed out. Comparable progress has been made in the field of super-hard irons for crushing, grinding and pulverizing service and in more highly alloyed compositions resistant to corrosion and heat.

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RECENT PUBLICATIONS OF MANUFACTURERS

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland

Chamfering—Cimatool Co., Dayton, O., has issued a folder which gives a comprehensive treatment of gear chamfering. Besides illustrations and specifications, engineering data is embodied.

Rotoblast Cleaning — Pangborn Corp., Hagerstown, Md., has issued a folder describing and illustrating the Rotoblast castings cleaning unit. Some specifications are included in the folder.

Protective Coatings — M. W. Kellogg Co., Jersey City, N. J., has available a bulletin containing information on IBS aluminum coatings. Illustrations showing typical applications of the coatings and specifications are embodied.

Grinders — Dumore Co., Racine, Wis., has issued a 2-color folder illustrating its latest line of grinders. Specifications are given with each illustration. The folder is entitled, "A Grinder and Speed for Every Need."

Switchgears—Delta-Star Electric Co., 2400 Block, Fulton street, Chicago, has issued bulletin 66 describing its line of metal-clad switchgears. Many illustrations and specifications are embodied in the bulletin along with some engineering information.

Punching Units — Progressive Welder Co., 737 Piquette avenue, Detroit, has published bulletin 3803 describing its hydraulic punching units. The bulletin contains illustrations and specifications regarding the units.

Hoists — Northern Engineering Works, 2615 Atwater street, Detroit, has available bulletin H-104 illustrating a few of the many types of Hi-Lift hoists which are manufactured by the company. Some specifications are given.

Pneumatic Machinery — Curtis Pneumatic Machinery Co., 1996 Kienlan avenue, St. Louis, has available a 28-page booklet giving summaries by industries of practical applications of air power. Besides illustrations, much research data is included.

Compressors—Pennsylvania Pump & Compressor Co., Easton, Pa., has available bulletin 180 which describes its horizontal Duplex, double acting air or gas compression for either single or 2-stage compression. The bulletin also contains illustrations, specifications and engineering data.

Straightening Machines — Medart Co., 3500 DeKalib street, St. Louis, has issued a booklet describing its line of bar and tube straightening, polishing and sizing machines. Illustrations and specifications are given along with considerable engineering data.

Pulleys—Hill Clutch Machine & Foundry Co., 6400 Breakwater avenue, Cleveland, has published catalog 37-C which lists machine molded, cast iron pulleys, ranging in size from 6 to 72 inches in diameter. Much technical information is included.

Lathes—South Bend Lathe Works, 425 East Madison street, South Bend, Ind., has available a 72-page catalog illustrating and describing the entire line of back-geared, screw-cutting, metalworking precision lathes which it manufactures. Much engineering data are included.

Neoprene—E. I. du Pont de Nemours & Co., Wilmington, Del., has published volume 1 of its publication entitled, "The Neoprene Notebook." Publication is planned to give the engineer and manufacturer information, laboratory data, and application reports on Neoprene.

Recorders—Bristol Co., Waterbury, Conn., has issued bulletin 496 giving information on the use of its electrical recorders as used to give close control and reveal losses in excess power consumption that may be eliminated. Engineering data are included.

Conveyors — Standard Conveyor Co., North St. Paul, Minn., has issued catalog No. 2 which illustrates and briefly describes the various applications of conveyors in steel mills, foundries and machine shops. Detailed drawings and specifications are given of the latest bearings designed for these industries.

Bearings—New Departure, division General Motors Corp., Bristol, Conn., has released a booklet entitled "Interchangeable Bearings." The publication, No. R10, contains numerically arranged lists of competitive ball bearings, with corresponding numbers of interchangeable New Departure bearings. Space is also devoted to alphabetically arranged definitions of letters and letter combinations used by manufacturers to identify bearing characteristics.

Tile Conduit—American District Steam Co., North Tonawanda, N. Y., has published a revised 8-page bulletin No. 35-67A on Adsco-bannon tile conduit and corning filler insulation for underground steam or hot water lines. Illustrations, details of construction and their applications are also included.

Diesel Engines—Caterpillar Tractor Co., Peoria, Ill., has available a 31-page booklet describing and giving the maximum and rated performance curves of the seven current sizes of diesel engines manufactured by the company. The booklet also contains graphs, engineering data and specifications.

Wires — Wire division, United States Rubber Products, 1790 Broadway street, New York, has announced the availability of a new illustrated manual for electrical engineers, contractors, purchasing agents and others concerned with standard construction. Specifications of wires and cables are also embodied.

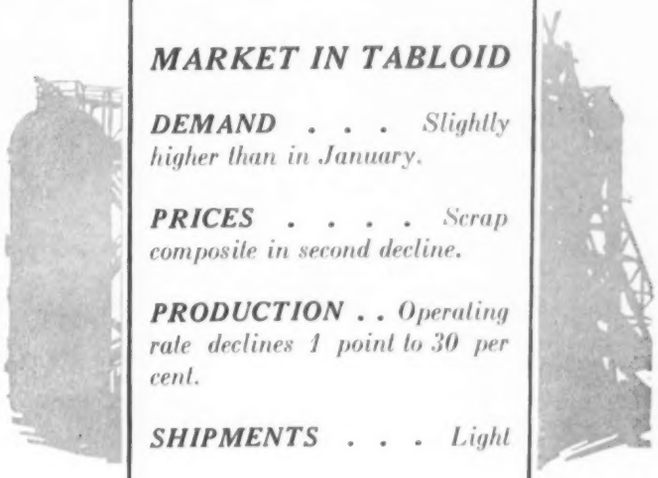
Electric Furnaces — American Bridge Co., Frick Bldg., Pittsburgh, has published a 23-page booklet describing the Heroult electric furnace for steel mills and foundries. The booklet contains considerable engineering data and specifications. It also includes many illustrations and graphs showing types of furnaces and capacities, layout plans and suggestions as to installations.

Bearings—Shafer Bearing Corp., 35 East Wacker drive, Chicago, is offering catalog 14 which contains its complete line of radial-thrust roller bearings, and self-aligning ball and roller bearing units for a full range of industrial and machine applications. Illustrations along with specifications, tables and engineering data are included in the catalog. In addition, a price list is also available keyed with the catalog.

Measuring Instruments — Carl Zeiss, 485 Fifth avenue, New York, has issued an interesting 125-page booklet embodying general information on industrial measuring and gaging instruments. The booklet is divided into five groups which include instruments for measuring and gaging lengths, for checking angles and angular divisions, instruments for checking gears, for gaging and measuring threads and miscellaneous gaging. Illustrations and engineering data are included.

Steel Buying Holding January Gains

Operating Rate Off Point; Scrap Weaker; Auto Output Higher



MARKET IN TABLOID

DEMAND . . . *Slightly higher than in January.*

PRICES . . . . *Scrap composite in second decline.*

PRODUCTION . . *Operating rate declines 1 point to 30 per cent.*

SHIPMENTS . . . *Light*

■ CONDITIONS causing steel consumers to limit their purchases to current requirements have undergone no change and a waiting policy continues to rule the market.

In general the volume of incoming business shows a slight gain over the December rate. Specifications are well spread and cover all forms and grades of steel. That most buyers ask immediate delivery indicates inventories are well cleared.

Reduction of $2 per ton in the base price of cold-rolled sheets and abolition of the former extra of $2 per ton for oiling brings that grade of sheets to a parity with its competitive material, hot-rolled, single-pickled and oiled sheets. Both these are used principally in automotive construction and for other purposes as well. The change in price is an adjustment to meet conditions that have existed for some time between the two.

With production at many centers holding unchanged from the previous week and various adjustments at other centers to meet demands of light buying the national operating rate lost 1 point last week, to 30 per cent. Chicago was unchanged at 25 per cent, Eastern Pennsylvania at 30, Wheeling at 44, Cleveland at 33 and Detroit at 47. Pittsburgh declined 1 point to 32 per cent, Youngstown 3 points to 23, Birmingham 2 points to 61, Cincinnati 16 points to 28 and St. Louis 8 points to 21. New England gained 7 points to 27 per cent and Buffalo 4.5 points to 18.5.

Shipbuilding needs following tanker and cargo ship placements are relied on to furnish tonnage over an extended period, some being placed currently. New bids may be called on the 12 cargo ships planned by the maritime commission, some figures being regarded as too high. Much of the steel for craft already placed has not yet reached the buying stage and will be placed gradually as work progresses. Naval construction is beginning to furnish some tonnage as warship construction gets under way.

Low level of railroad buying in markets allied to the steel industry is exemplified in the fact that during January only 25 cars were bought. Imminent decision on the request for higher freight rates, expected within two or three weeks, is a deterrent to commitments. Whether the expected increase will provide revenue sufficient for large buying is a question, but it is believed pressing needs are sufficient to loose considerable tonnage in any event. Inquiries now current are of small proportions.

Steel ingots produced in January totaled 1,723,266 gross tons, the lowest January in 20 years except for 1932 and 1933, nearly 18 per cent larger than December, 1937, and 63 per cent less than in January, 1937, which was the highest January on record. Steel production in January was at an average of 29.14 per cent of capacity, compared with 25.36 per cent in December.

Finished steel shipments by the United States Steel Corp. in January increased 29,252 tons over December, to 518,322 tons, the first monthly gain following nine consecutive decreases. This was 5.98 per cent higher than the December shipments but 55 per cent lower than for January of last year.

Automobile assemblies gained slightly more than 6000 last week, due to an increase by Chrysler. General Motors produced 20,950, compared with 21,230 the week before; Ford's output was 20,760 against 20,700 the preceding week; Chrysler advanced to 9050 from 2950. Other producers assembled 7050, compared with 6563.

Weakness in steelmaking scrap, bringing a decline of 25 cents per ton on two leading grades at Chicago, has caused STEEL's composite of steelmaking scrap to decline the second consecutive week, losing 8 cents to $13.75. This is the same level as the first week in January. Scrap prices in the main are largely nominal, almost the only actual factor being export demand, which is effective on the Atlantic coast. The iron and steel composite is unchanged at $38.94 and the finished steel composite at $61.70.

The world picture shows Great Britain holding its steel production close to its highest level, with mills booked months ahead. Continental countries, dependent on exports, find demand somewhat slack and competition keen.

COMPOSITE MARKET AVERAGES

	Feb. 12	Feb. 5	Jan. 29	One Month Ago Jan., 1938	Three Months Ago Nov., 1937	One Year Ago Feb., 1937	Five Years Ago Feb., 1933
Iron and Steel	$38.94	$38.94	$38.97	$38.95	$38.96	$36.74	$27.94
Finished Steel	61.70	61.70	61.70	61.70	61.70	55.92	45.35
Steelworks Scrap ..	13.75	13.83	13.90	13.85	13.32	19.19	6.33

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Feb. 12 1938	Jan. 1938	Nov. 1937	Feb. 1937
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.20c
Steel bars, Chicago	2.50	2.50	2.50	2.25
Steel bars, Philadelphia	2.74	2.75	2.75	2.49
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	2.10
Shapes, Pittsburgh	2.25	2.25	2.25	2.05
Shapes, Philadelphia	2.45½	2.46½	2.46½	2.25½
Shapes, Chicago	2.30	2.30	2.30	2.10
Tank plates, Pittsburgh	2.25	2.25	2.25	2.05
Tank plates, Philadelphia	2.43½	2.44½	2.44½	2.23½
Tank plates, Chicago	2.30	2.30	2.30	2.10
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	2.15
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	2.80
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.40
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.25
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	2.90
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.50
Plain wire, Pittsburgh	2.90	2.90	2.90	2.60
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$4.85
Wire nails, Pittsburgh	2.75	2.75	2.75	2.25

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$34.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	34.00
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	34.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	47.00	47.00	47.00	43.00

Pig Iron

	Feb. 12 1938	Jan. 1938	Nov. 1937	Feb. 1937
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$22.30
Basic, Valley	23.50	23.50	23.50	20.50
Basic, eastern del. East. Pa.	25.26	25.34	25.34	22.51
No. 2 fdy., del. Pittsburgh	25.21	25.21	25.21	22.21
No. 2 fdry., Chicago	24.00	24.00	24.00	21.00
Southern No. 2, Birmingham	20.38	20.38	20.38	17.63
Southern No. 2, del. Cincinnati	23.89	23.89	23.89	20.94
No. 2X eastern, del. Phila.	26.135	26.21½	26.21½	23.38½
Malleable, Valley	24.00	24.00	24.00	21.00
Malleable, Chicago	24.00	24.00	24.00	21.00
Lake Sup., charcoal, del. Chicago	30.24	30.24	30.14	26.54
Gray forge, del. Pittsburgh	24.17	24.17	24.17	21.17
Ferromanganese, del. Pittsburgh	107.49	107.49	107.35	84.79

Scrap

Heavy melting steel, Pittsburgh	$14.25	$14.05	$14.10	$19.65
Heavy melt. steel, No. 2, E. Pa.	13.75	14.05	12.25	17.75
Heavy melting steel, Chicago	12.50	13.25	12.55	19.50
Rails for rolling, Chicago	15.25	14.90	15.10	20.75
Railroad steel specialties, Chicago	15.25	15.75	16.75	21.00

Coke

Connellsville, furnace, ovens	$4.25	$4.25	$4.37	$4.00
Connellsville, foundry, ovens	5.25	5.25	5.25	4.25
Chicago, by-product foundry, del.	11.00	11.00	11.00	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Prices Subject to Quantity Extras and deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.74c
Philadelphia, del.	2.70c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pac. base pts. f.o.b. cars	2.97½c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, delivered	3.49c
Philadelphia, del.	3.45c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pac. base pts. f.o.b. cars	3.82½c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.10c
New York, delivered	4.14c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pac. base pts. f.o.b. cars	4.42½c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.00c
Gary	3.10c
Detroit, delivered	3.21c
Philadelphia, del.	3.30c
New York, del.	3.34c
St. Louis, del.	3.23c
Granite City, Ill.	3.20c
Pac. base pts. f.o.b. cars	3.62½c

Cold Rolled No. 20

Pittsburgh	3.45c
Gary	3.55c
Detroit, delivered	3.66c
Philadelphia, del.	3.75c
New York, del.	3.79c
St. Louis	3.68c
Granite City, Ill.	3.65c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Waste-waste, 2.80c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.54c
Philadelphia, del.	2.44½c
Boston, delivered	2.66c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific basing points, f.o.b. cars	2.82½c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46½c
New York, del.	2.51¼c
Boston, delivered	2.64½c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo	2.35c
Gulf Ports	2.66c
Birmingham	2.40c
Pacific coast basing pts., f.o.b. cars	2.82½c
St. Louis, del.	2.52c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific coast basing pts., f.o.b. cars	3.02½c
Philadelphia, del.	2.75c
Boston, delivered	2.86c
New York, del.	2.79c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo	2.40c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.45c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.50c
Gulf ports	2.85c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.75c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.30c
Chicago, Buffalo, Cleveland, Birm., Young.	2.35c
Gulf ports	2.80c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	74
Single loop bale ties, (base C. L. column)	63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Galvanized wire	2.95c
Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.	
Spring wire, Pitts. or Cleveland	3.50c
Do., Chicago up $1, Worc. $2.	

Cold-Finished Carbon Bars, Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 3.00c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	0.15
6100 bars	1.20
6100 spring	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot-rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23¾-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.61c
Philadelphia, del.	2.70c
New York, del.	2.74c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.41c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	4.30c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality.	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	2.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plate, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.: ½ to 7/8-inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
7/8-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	

Cut Nails

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts, Lorain, O., to consumers in carloads, Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch, lap weld	59½
12-inch, lap weld	58½

Butt Weld

Iron

	Blk.	Galv.
¾	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15

Lap Weld

1½	23½	7
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2"OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.20-58.20
6 to 24-in., Chicago	54.20-55.20
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-*inch base; gross ton*

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

6 x 6 *to* 9 x 9-*in., base*

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to 5/32-inch incl.	47.00
Do., over 5/32 to 47/64-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.00- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.63

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls. to jobbers	7.25c
Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia	$29.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	.....	24.66	.....
Boston from Birmingham	26.57	.....	26.07	.....
Boston from Everett, Mass.	26.30	26.80	25.80	27.30
Boston from Buffalo	26.45	26.95	25.95	27.45
Brooklyn, N. Y., from Bethelehem	27.47	27.97	.....	.....
Brooklyn, N. Y., from Bmghm.	27.25	.....	.....	.....
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	24.42	.....	23.30	.....
Cincinnati from Hamilton, O.	24.27	25.11	24.61	.....
Cincinnati from Birmingham	23.89	.....	22.89	.....
Cleveland from Birmingham	24.32	.....	23.82	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.10	27.10	26.60	27.60
Newark, N. J., from Birmingham	26.21	.....	.....	.....
Newark, N. J., from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham	25.58	.....	25.46	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....
Pittsburgh district from Neville Island	Neville, base plus 63c, 76c, and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95
St. Louis, northern	24.55	24.55	24.05	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	26.08	26.08	.....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phil. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.24
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80
New Jersey	51.00

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$20.00
Do., for barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd.	$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.49
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot	33.00
Do., New Orleans	33.00
Do., 26-28%, Palmerton	39.00
Ferrosilicon, 50% freight allowed, c.l.	69.50
Do., ton lot	80.50
Do., 75 per cent	126.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	106.50
2% carbon 111.50; 1%,	121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	1.95-2.00
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod-plant, frt. all., net ton	142.50
Contract, ton lots	145.00
Spot, ton lots	150.00
Ferrophosphorus, per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb. f.o.b. mill	0.95
Molybdate, lb. cont. f.o.b. mill	0.80
Technical molybdenum trioxide, 53 to 60% molybdenum, f.o.b. mill	0.80

†Carloads. Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper—Electro, del. Conn.	Copper—Lake, del. Midwest	Copper—Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead New York N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony American Spot, N. Y.	Nickel Cathodes
Feb. 5	10.00	10.12½	9.52½	40.75	41.12½	4.90	4.75	5.00	20.00	13.75	35.00
Feb. 7	10.00	10.12½	9.52½	40.62½	41.00	4.90	4.75	5.00	20.00	13.75	35.00
Feb. 8	10.00	10.12½	9.52½	40.62½	41.00	4.75	4.60	4.75	20.00	13.75	35.00
Feb. 9	10.00	10.12½	9.52½	40.87½	41.25	4.75	4.60	4.75	20.00	13.75	35.00
Feb. 10	10.00	10.12½	9.52½	40.62½	41.00	4.50	4.35	4.75	20.00	13.75	35.00
Feb. 11	10.00	10.12½	9.52½	40.50	40.87½	4.50	4.35	4.75	20.00	13.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.00c *Conn. copper*

Sheets

Yellow brass (high)	16.62½
Copper, hot rolled	18.12½
*Lead, cut to jobbers	7.75
Zinc, 100-lb. base	10.00

Tubes

High, yellow brass	19.37½
Seamless copper	18.62½

Rods

High yellow brass	12.62½
Copper, hot rolled	14.62½

Anodes

Copper, untrimmed	15.37½

Wire

Yellow brass (high)	16.87½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

*New York	6.10-6.25
*Cleveland	6.75-7.00
*Chicago	5.50-5.75
*St. Louis	5.25-5.75

Heavy Copper and Wire

New York, No. 1	7.25-7.37½
Cleveland, No. 1	7.25-7.50
*Chicago, No. 1	7.12½-7.37½
*St. Louis	7.00-7.25

Composition Brass Borings

*New York	5.10-5.25

Light Copper

New York	5.25-5.37½
Cleveland	5.50-5.75
*Chicago	5.50-5.75
St. Louis	5.00-5.25

Light Brass

*Cleveland	3.50-3.75
*Chicago	3.50-3.75
St. Louis	3.25-3.75

Lead

New York	3.50-3.75
*Cleveland	3.25-3.50
Chicago	3.75-3.87½
St. Louis	3.25-3.50

Zinc

New York	2.12½-2.25
*Cleveland	2.25-2.50
St. Louis	2.25-2.50

Aluminum

*Borings, Cleveland	5.75-6.00
Mixed cast, Cleve.	9.75-10.00
*Clips, soft, Cleve.	13.25-13.50
Mixed cast, St. L.	9.75-10.00

SECONDARY METALS

*Brass, ingot, 85-5-5-5, lcl.	10.25
*Stand. No. 12 alum.	16.50-17.00

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-In. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled No. 10	Sheets: Hot Roll Ann. No. 24	Sheets: Galv. No. 24
Boston	4.20c	4.40c	5.40c	4.08c	4.07c	5.73c	4.15c	4.90c	5.10c
New York (Metropolitan)	4.12	4.32	4.32	4.00	3.97	5.60	4.07	4.50	5.00
Philadelphia	4.00	4.10	4.35	3.90	3.90	5.25	4.00	4.65	5.30
Baltimore	4.00	4.20	4.45	3.90	3.90	5.50	3.95	4.50	4.70
Norfolk, Va.	4.15	4.35	4.60	4.05	4.05	5.65	4.10	4.70	5.35
Buffalo	3.90	4.22	4.22	3.92	3.80	5.52	3.97	4.80	5.35
Pittsburgh	3.80	4.00	4.00	3.70	3.70	5.30	3.75	4.50	5.15
Cleveland	3.75	4.16	4.16	3.86	3.86	5.46	3.91	4.66	5.31
Detroit	3.935	4.185	4.185	3.95	3.95	5.55	3.935	4.685	5.40
Cincinnati	4.05	4.25	4.25	3.95	3.95	5.55	4.00	4.75	5.40
Chicago	3.85	4.10	4.10	3.75	3.75	5.35	3.85	4.60	5.25
Minneapolis	4.10	4.35	4.35	4.00	4.00	5.60	4.10	4.75	5.25
Milwaukee	3.96	4.21	4.21	3.86	3.86	5.46	3.96	4.71	5.36
St. Louis	4.09	4.34	4.34	3.99	3.99	5.59	4.09	4.84	5.49
Kansas City	4.34	4.59	4.59	4.24	4.24	5.84	4.10	4.85	5.50
Memphis	4.31	4.51	4.51	4.21	4.21	5.85	4.26	5.01	5.66
Chattanooga	4.21	4.41	4.41	4.11	4.11	5.91	4.16	4.06	4.66
Tulsa, Okla.	4.79	5.04	5.04	4.69	4.69	6.29	4.79	5.54	6.19
Birmingham, Ala.	3.85	4.05	4.05	3.75	3.75	5.96	3.80	4.55	5.20
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	4.75	5.15
Houston, Tex.	3.75	6.00	6.40	3.95	3.95	6.00	4.50	5.25	5.65
Seattle	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.35	5.90
Portland, Oreg.	4.00	4.50	6.50	4.00	4.25	5.70	4.20	5.15	5.90
Los Angeles	4.30	4.80	6.55	4.30	4.30	4.30	4.50	5.00	5.25
San Francisco	4.20	4.80	6.50	4.05	4.05	5.55	4.30	5.15	5.85

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars: 2300	3100
Boston	3.845c	4.65c	4.50c	7.97c	6.52c	6.27c	8.37c	8.97c	7.52c
New York	3.92	4.57	4.32	7.82	6.37	6.12	....	9.00	7.55
Philadelphia	3.88	4.53	4.25	....	....	....	....	....	....
Baltimore	....	4.50	4.15	....	....	....	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.79	4.35	4.10	7.60	6.15	5.90	8.00	8.60	8.15
Pittsburgh	....	4.15	3.95	7.70	6.25	8.50	9.10	8.70	7.25
Cleveland	3.60	4.30	3.95	7.78	6.33	6.33	8.18	8.60	7.15
Detroit	3.78	4.30	4.085	7.89	6.44	6.19	7.74	8.88	7.43
Cincinnati	....	4.50	4.07	7.91	6.46	6.21	9.31	8.92	7.47
Chicago	3.87	4.30	4.05	7.60	6.15	5.90	8.00	8.60	7.15
Minneapolis	....	4.77	4.25	7.95	6.50	8.97	9.57	9.17	7.72
Milwaukee	....	4.41	4.16	7.81	6.36	6.11	8.21	8.81	7.36
St. Louis	3.96	4.54	4.29	7.94	6.49	6.24	8.34	8.94	7.48
Kansas City	4.37	4.79	....	....	....	....	....	....	....
Memphis	....	4.80	....	....	....	....	....	....	....
Chattanooga	....	4.86	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.24	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.85	6.05	....	8.00	8.00	8.65	....	....
Portland, Oreg.	....	5.85	5.85	9.00	8.00	7.85	8.70	....	....
Los Angeles	5.96	6.85	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	9.30	6.80	5.20	9.65	8.80	8.65	9.30	10.65	9.80

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, Feb. 10

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons: Quoted in dollars at current value	Continental Channel or North Sea ports, metric tons: **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$30.00 6 0 0	$19.02	2 7 6
Basic bessemer	....	.....	.....
Hematite, Phos. .03-.05	36.25 7 5 0*	19.50	2 9 0
Billets	$39.38 7 17 6	$43.01	5 7 6
Wire rods, No. 5 gage	56.38 11 5 6	42.00 to 44	5 5 0 to 5 10 0
Standard rails	$50.63 10 2 6	$46.00	5 15 0
Merchant bars	2.62c 11 15 0	1.91c	5 5 0
Structural shapes	2.37c 10 12 6	1.76c	4 17 6
Plates, †¼ in. or 5 mm.	2.58c 11 11 3	2.22c	6 2 6
Sheets, black, 24 gage or 0.5 mm.	3.12c 14 0 0	2.81c	7 15 0*
Sheets, gal., 24 ga., corr.	3.74c 16 15 0	3.44c	9 10 0
Bands and strips	2.95c 13 5 0	1.91c to 1.99c	5 5 0 to 5 10 0
Plain wire, base	4.35c 19 10 0	2.22c to 2.63c	6 2 6 to 7 5 0
Galvanized wire, base	5.18c 23 5 0	2.84c to 2.94c	7 17 6 to 8 2 6
Wire nails, base	4.13c 18 10 0	2.53c to 2.71c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$5.63 1 2 6	....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$27.25	5 9 0(a)	$18.48	563½	$24.58	725	$25.44	63
Basic bess. pig iron	25.00	5 0 0(a)	.....	...	.....	...	28.06	(b)69.50
Furnace coke	8.75	1 15 0	6.20	189	7.29	215	7.67	19
Billets	39.38	7 17 6	27.55	840	32.54	960	38.97	96.50
Standard rails	2.26c	10 2 6	1.73c	1,150	2.06c	1,375	2.38c	132
Merchant bars	2.55c	11 9 0	1.62c	1,080	1.65c	1,100	1.98c	110
Structural shapes	2.46c	11 0 6	1.58c	1,055	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm.	2.61c	11 14 3	2.03c	1,350	2.06c	1,375	2.29c	127
Sheets, black	3.51c	15 15 0§	2.35c	1,565‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	4.13c	18 10 0	3.38c	2,250	4.50c	3,000	6.66c	370
Plain wire	4.35c	19 10 0	2.49c	1,660	2.48c	1,650	3.11c	173
Bands and strips	2.72c	12 4 0	1.82c	1,210	2.32c	1,550	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. (b) hematite. °Close annealed.

**Gold pound sterling carries a premium of 64.4 per cent over paper sterling.

—The Market Week—

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	10.00
Birmingham, No. 2	9.00
Bos. dock No. 1 exp.	14.00
N. Eng. del. No. 1	13.50
Buffalo, No. 1	12.50-13.00
Buffalo, No. 2	10.50-11.00
Chicago, No. 1	12.25-12.75
Cleveland, No. 1	12.50-13.00
Cleveland, No. 2	11.50-12.00
Detroit, No. 1	9.50-10.00
Eastern Pa., No. 1	15.00
Eastern Pa., No. 2	13.50-14.00
Federal, Ill.	11.00-11.50
Granite City, R. R.	12.50-13.00
Granite City, No. 2	11.00-11.50
Los Angeles, No. 1	15.00-17.50
Los Angeles, No. 2	13.50-16.00
New York, No. 1	†11.00
N. Y. dock No. 1 exp.	13.50
Pitts., No. 1 (R. R.)	15.50-16.00
Pitts., No. 1 (dlr.)	14.00-14.50
Pittsburgh, No. 2	13.00-13.50
St. Louis, R. R.	12.50-13.00
St. Louis, No. 2	11.00-11.50
San Francisco, No. 1	14.00-15.00
Seattle, No. 1	8.00
Toronto, dirs. No. 1	10.00
Valleys, No. 1	13.50-14.00

COMPRESSED SHEETS

Buffalo, dealers	10.50-12.00
Chicago, factory	11.25-11.75
Chicago, dealer	10.25-10.75
Cleveland	12.00-12.50
Detroit	10.25-10.75
E. Pa., new mat.	15.00
E. Pa., old mat.	10.50-11.00
Los Angeles	13.00-16.00
Pittsburgh	14.00-14.50
St. Louis	7.25- 7.75
Valleys	12.50-13.00

BUNDLED SHEETS

Buffalo	11.50
Cincinnati, del.	9.50-10.00
Cleveland	9.00- 9.50
Los Angeles	11.50-14.50
Pittsburgh	13.00-13.50
St. Louis	6.50- 7.00
Toronto, dealers	7.00

SHEET CLIPPINGS, LOOSE

Chicago	7.00- 7.50
Cincinnati	6.00- 6.50
Detroit	7.00- 7.50
† Los Angeles	4.00
St. Louis	5.50- 6.00

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	17.50-18.00
Chicago (3 ft.)	15.50-16.00
Chicago (2 ft.)	16.00-16.50
Cincinnati, del.	17.00-17.50
Detroit	14.50-15.00
Los Angeles	18.00-22.00
Pitts, 3 ft. and less	17.75-18.25
St. Louis, 2 ft. & less	15.00-15.50

STEEL RAILS, SCRAP

Boston district	†11.00
Buffalo	15.50-16.00
Chicago	12.50-13.00
Cleveland	16.50-17.00
Pittsburgh	15.75-16.25
St. Louis	13.00-13.50
Seattle	10.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston, district	†8.25- 8.50
Buffalo	10.50-11.00
Chicago, net	8.50- 9.00
Cincinnati, dealers	5.50- 6.00
Detroit, net	8.50- 9.00
Eastern Pa.	13.00-13.50
New York, fdry.	†9.50-10.00
St. Louis	8.50- 9.00
Toronto, deal'rs, net	9.00

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	16.50-17.00
Chicago, leaf	15.50-16.00
Eastern Pa.	17.50-18.00
Pittsburgh	17.75-18.00
St. Louis	15.00-15.50

ANGLE BARS—STEEL

Chicago	14.50-15.00
St. Louis	12.50-13.00

RAILROAD SPECIALTIES

Chicago	15.00-15.50

LOW PHOSPHORUS

Buffalo, crops	17.00-17.50
Cleveland, crops	19.50-20.50
Eastern Pa., crops	19.00-19.50
Pittsburgh, crops	17.50-18.00

FROGS, SWITCHES

Chicago	12.50-13.00
St. Louis, cut	13.50-14.00

SHOVELING STEEL

Federal, Ill.	11.00-11.50
Granite City, Ill.	11.00-11.50
Los Angeles (net)	16.00-18.00
Toronto, dealers	8.00

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Chicago, No. 1 net	10.00-10.50
Cincinnati, No. 2	9.50-10.00
Eastern Pa., No. 1	15.50-16.00
St. Louis, No. 1	8.50- 9.00
St. Louis, No. 2	12.50-13.00
Toronto, No. 1 dlr.	16.00

SPECIFICATION PIPE

Eastern Pa.	14.00-14.50
New York	†9.00- 9.50

BUSHELING

Buffalo, No. 1	10.50-11.00
Chicago, No. 1	11.25-11.75
Cincin., No. 1, deal.	8.50- 9.00
Cincinnati, No. 2	3.00- 3.50
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1, new	9.50-10.00
Valleys, new, No. 1	12.50-13.00
Toronto, dealers	7.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Buffalo	6.25- 6.75
Chicago	6.00- 6.50
Cincinnati, dealers	4.00- 4.50
Cleveland	7.50- 8.00
Detroit	5.25- 5.75
Eastern Pa.	8.00
Los Angeles	4.00- 8.00
New York	†5.00- 5.50
Pittsburgh	8.00- 8.50
St. Louis	5.00- 5.50
Toronto, dealers	7.00
Valleys	9.50-10.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†2.50
Buffalo	6.50- 7.00
Cincinnati, dealers	3.50- 4.00
Cleveland	9.00- 9.50
Detroit	6.25- 6.75
Eastern Pa.	7.50
New York	†4.50- 5.00
Pittsburgh	7.00- 7.50
Toronto, dealers	7.50

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem.	†7.50- 8.00
Bos. dist. for mills	†7.00- 7.50
Buffalo	6.50- 7.00
Chicago	6.00- 6.50
Cincinnati, dealers	3.50- 4.00
Cleveland	9.00- 9.50
Detroit	6.25- 6.75
E. Pa., chemical	13.50-14.00
New York	†4.50- 5.00
St. Louis	5.00- 5.50
Toronto, dealers	7.50

PIPE AND FLUES

Cincinnati, dealers	7.00- 7.50
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	9.00- 9.50
Chicago, net	8.50- 9.00
Cincinnati	5.50- 6.00
Eastern Pa.	13.00-13.50
New York	†9.50-10.00
St. Louis	9.00- 9.50

FORGE FLASHINGS

Boston district	†7.00
Buffalo	10.50-11.00
Cleveland	11.00- 11.50
Detroit	9.00- 9.50
Los Angeles	9.00
Pittsburgh	12.75-13.25

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.50-16.00

ARCH BARS, TRANSOMS

St. Louis	14.00-14.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	12.00-12.50
Chicago, elec. fur.	11.50-12.00
Eastern Pa.	14.00-14.50
St. Louis	9.50-10.00
Toronto	8.00

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	16.00-16.50
Boston district	†14.00
Chicago, net	18.00-18.50
Eastern Pa.	21.50-22.00
St. Louis	17.50-18.00

SHAFTING

Boston district	14.50-15.00
New York	†15.50-16.00
Eastern Pa.	19.00-19.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron	†10.00
Buffalo, steel	16.00-16.50
Chicago, iron	15.00-15.50
Chicago rolled steel	15.00-15.50
Cincinnati, iron	15.00-15.50
Eastern Pa., iron	15.50
Eastern Pa., steel	17.50-18.00
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel	17.75-18.25
St. Louis, iron	14.00-14.50
St. Louis, steel	15.50-16.00

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†11.00
N. Eng. del. No. 2	12.00
N. Eng. del. textile	15.50-16.00
Buffalo, cupola	13.50-14.00
Buffalo, mach.	15.00-15.50
Chicago, agri. net	10.50-11.00
Chicago, auto	11.50-12.00
Chicago, railr'd net	10.50-11.00
Chicago, mach. net	12.00-12.50
Cincin., mach. cup.	10.50-11.00
Cleveland, mach.	17.00-17.50
Eastern Pa., cupola	16.00-16.50
E. Pa., mixed yard	14.00-14.50
Los Angeles	13.00-14.00
Pittsburgh cupola	16.00-16.50
San Francisco, del.	13.50-14.00
Seattle	8.00
St. Louis, No. 1	10.50-11.00
St. L., No. 1, mach.	11.00-11.50
Toronto, No. 1, mach., net	12.50

HEAVY CAST

Boston dist. break.	†9.00- 9.50
N. Eng., del.	11.50-12.00
Buffalo, break	11.00-11.50
Cleveland, break.	14.50-15.50
Detroit, break.	10.00-10.50
Detroit, auto net	12.50-13.00
Eastern Pa.	14.50
Los Angeles	13.00-14.00
New York, break.	†10.50-11.00
Pittsburgh	12.50-13.00

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	16.00
Buffalo	13.50-14.00
Chicago, R. R.	14.00-14.50
Cincin., agri. del.	10.50-11.00
Cleveland, rail	15.50-16.00
Detroit, auto	11.50-12.00
Eastern Pa., R. R.	16.50-17.50
Los Angeles	13.00-14.00
Pittsburgh, rail	14.25-14.75
St. Louis, R. R.	13.00-13.50

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Boston	†12.00
Chicago	15.00-15.50
Eastern Pa.	18.00-18.50
New York	†15.00-15.50
St. Louis	14.00-14.50

LOCOMOTIVE TIRES

Chicago (cut)	15.50-16.00
St. Louis, No. 1	14.75-15.25

LOW PHOS. PUNCHINGS

Buffalo	16.00-16.50
Chicago	14.50-15.00
Eastern Pa.	19.00-20.00
Pittsburgh (heavy)	17.50-18.00
Pittsburgh (light)	17.00-17.50
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ % Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00-13.00
No. Afr. low phos.	nominal
Swedish low phos.	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton. unit, duty paid nom.	24.50-25.50
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$25.50-26.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% non.	45.00
So. African, 50-52% nom.	45.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 78

Chicago—The flurry caused by the recently announced $4 reduction in cold-rolled wide material for the automotive trade, lasted only a day or so because such a movement for weeks had been anticipated as inevitable. The reduction came through the cutting off of the $2 extra for oiling plus a $2 cut in the price of the sheet. Sharp competition for certain auto purposes had been afforded by some makers of hot-rolled single pickled and oiled sheets. The effect of the latest price move is to put hot-rolled and cold-rolled No. 20 gage sheets upon the same price basis for automotive consumption. The cut in these particular sheets now has been extended by Chicago warehouses into their price schedules. But it is the expectation that other sheet prices will remain unchanged.

Demand for sheets in this district continues low. Even the usual business from stove and refrigerator builders has been reduced materially. The farm implement makers still are taking sheets regularly but the volume has been reduced.

Philadelphia—It is pointed out that the reduction of $2 per ton on cold-rolled sheet base price and abandonment of the $2 per ton extra for oiling simply represents an adjustment to align more closely with hot-rolled single pickled sheets. Net prices on base gages 17 to 22, inclusive, now are on a parity. Automotive demand is slack with one large interest now working only one shift and a second interest at about 20 per cent. A strike at a Michigan engine plant has held up body releases from Willys. No automotive sheet releases of importance have been issued for a number of weeks. Sheet requirements in other directions are small.

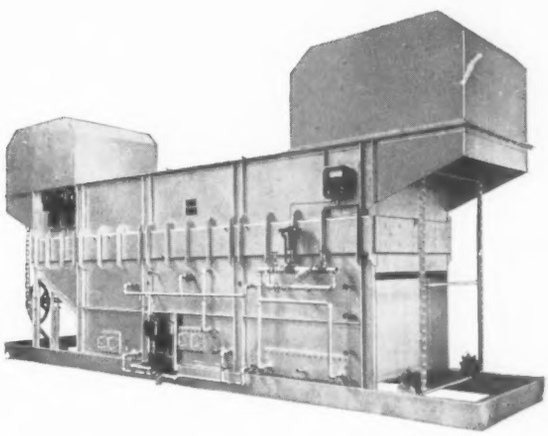
Pittsburgh — Elimination of the 10-cent oiling charge and reduction in price of $2 a ton have given users of cold-rolled sheets a $4 a ton reduction. Largely beneficial to automotive producers, the change is not expected to result in a great deal of business immediately. Production of common and full finished sheets holds steady at 29 per cent of capacity, while jobbing mills operate at 25 per cent. Galvanized sheet production last week was at 34 per cent of capacity, off 1 point from the previous week.

Cleveland—Most important news of the week was the announcement of a $2 reduction on the base price of cold-rolled sheets and elimination of the $2 oiling extra. This adjustment also applies on cold-finished mill-run sheets. Producers report incoming business continues to show some improvement but not to the extent hoped for. Consumer's stocks are being further reduced, but at the present rate of operations they are still more than ample to meet current needs. One large producer in the Pittsburgh district is reported to have recently booked 6000 tons of automotive sheets. Other consumers continue to order on a hand to mouth basis.

Boston — Reduction of $2 a ton in cold finished oil sheets has failed to stimulate buying of that grade materially. Consumption of this grade is not heavy in New England. There has been only slight increase in consumption and buying continues irregular for current needs, small orders for prompt delivery predominating.

New York—Reduction of $2 per ton on cold-finished sheets and abandonment of the $2 per ton oiling extra, brings this grade of sheets to the same level of its competitive material, hot-rolled single pickled and oiled sheets. The adjustment is

DETREX DEGREASERS



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From the complete line of Detrex Degreasers—ranging from small standard models to large, conveyorized machines—you can choose the unit to meet your cleaning requirements. Our engineers will gladly assist you in your cleaning problems.

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simply to put the competing grades on a parity.

Under the new schedules cold-reduced sheets, delivered, New York, are now 3.34c for No. 10 gage and 3.79c for No. 20. Manufacturers of electric refrigerators, washing machines and certain other household equipment stand to benefit principally.

Washington — Newport Rolling Mill Co., Newport, Ky., has been awarded approximately 504 tons, galvanized corrugated roofing sheets (45,000 squares) and 3000 pieces galvanized ridge roll for delivery, Panama, $50,080.24, bids Feb. 2, schedule 3325. Sheet Metal Mfg. Co., Youngstown, O., has been awarded most of 1570 tons of black and galvanized sheets for delivery to various navy yards. A small part of the inquiry went to Jones & Laughlin Steel Corp., Pittsburgh, and Newport Rolling Mill Co., Newport, Ky., bids Jan. 11.

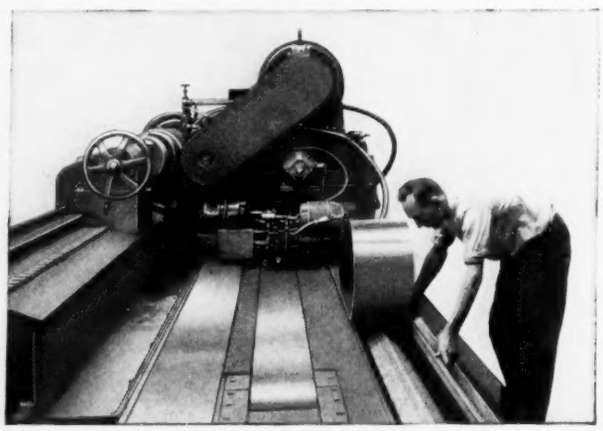
Buffalo — A limited improvement in a miscellaneous flow of light orders for sheets continues. There was a slight pickup in demand from structural sources. It is obvious from the size of orders that buyers are hesitant and placing orders for immediate needs only.

Cincinnati — Demand for sheets again showed an uninterruptetd improvement, gradual and broad. Volume has increased nearly to 40 per cent of capacity, exhibiting a partial recovery of automotive purchasing. Galvanized, in consideration of customary tonnage, retains leadership. Prices on cold-rolled were cut $2 a ton. Extras of $2 a ton for oiling, both on hot-rolled and cold-rolled, have been discontinued.

St. Louis—Moderate betterment is noted in demand for sheets, both with reference to new inquiries and shipping directions. Stove plants are preparing to resume production at a higher rate, and are making provision for raw materials. Outlet through the farm implement industry, while measurably below the peak last year, is still fairly broad.

Birmingham, Ala.—While there has been some increase in spot market for manufacturers' sheets, a slight decline is noted in roofing, while drum stock remains practically stationary with some slight increase probable. Generally, sheets are in somewhat less demand than a few days ago.

FARREL ROLL GRINDERS HAVE INVERTED "V" WAYS FOR LIFETIME ACCURACY



One of the important design features of the Farrel Roll Grinder which prevents wear and thus contributes to its high precision and high productive capacity is the inverted "V" type ways.

These ways are cast separate from the bed and made from a special alloy iron which is a cleaner, harder, closer-grained metal than can be obtained in ways which are cast as part of the bed. Carefully fitted and machined in place, they are an integral part of the bed.

Lubrication of the way surfaces is provided by an automatic flood system which serves the additional function of cleansing the ways of foreign matter which might settle on them. Double protection is afforded by the flexible metal guards which fit closely over the way channels to exclude dirt and grit.

Thus every precaution is taken to preserve the finished surface on which the carriage rides, the accuracy of which is essential to the most efficient functioning of a machine for fine precision grinding.

The inverted "V" ways of Farrel Roll Grinders show no distinguishable wear after years of operation. With the elimination of inaccuracies due to wear of the ways, the need for manipulating the machine by human skill in order to overcome the bad effects of wear has also been eliminated.

The low-cost, high-output, high-accuracy performance of Farrel Heavy Duty Roll Grinders is the result of a combination of design features which are fully described in Bulletin No. 111. A copy will be sent free on request.

FARREL

FARREL-BIRMINGHAM COMPANY, Inc.
ANSONIA, CONN.
New York • Buffalo • Pittsburgh • Akron • Chicago • Los Angeles

Strip

Strip Prices, Page 79

Pittsburgh—Strip production is still low, with hot strip operations reported off 3 points last week to 19 per cent of capacity. Cold strip operations, on the other hand, strengthened a little, rising 2 points to 20 per cent of capacity. There is no buying of any volume in strip in this market, making it probably the most inactive of finished steel products. No particular increase is anticipated until automotive production begins to climb.

Cleveland—Specifications for hot and cold-rolled wide and narrow strip steel continue to show only slight improvement over the corresponding period of January. Sellers have geared operations to actual demand, as consumers are ordering only for actual needs. While headway is being made against inventories of finished parts they are still heavy. Prices are unchanged.

Boston—Small orders are coming through in about the recent rate for prompt shipment. Advance buying is at a standstill. Dullness is emphasized by the lack of buying by the larger users. Some increase in scattered buying of hot strip indicates some rerollers are short of some sizes and specifications.

New York—There are signs that

consumers of hot strip are short of some specifications and sizes, although replacement buying has not developed beyond small shipments for immediate needs. Narrow cold strip demand is sluggish, the aggregate volume being in a fairly well sustained number of small orders. Cold-finished operations have not yet bettered a 30 per cent average.

Philadelphia — Demand for steel strip, which recently has shown some signs of improvement, has lost impetus and is slow.

Birmingham, Ala.—Business in strip is practically absent with no demand, at this season, for cotton ties.

Plates

Plate Prices, Page 78

Pittsburgh — Possibility of early action on freight rates, with following entry of railroads into the market is one of the main factors in an optimistic outlook among plate producers. Government maritime activities add possibilities for a better market later in the year. The present situation is still dull, with few inquiries appearing.

Cleveland—Steel plate requirements for wide or narrow widths are limited to small tonnages representing only actual requirements. Producers remain on reduced schedules with operations balancing incoming business. The city of Cleveland is expected to advertise for bids on the second section of a water main line from Parma reservoir to Rocky River involving about 1000 tons of 36-inch pipe. Ship repair work should also take considerable tonnage of plates over the next 60 days. Prices are unchanged.

Boston—Repair and modernization of 150 passenger cars and the construction of 50 all-steel passenger units by the New Haven has brightened prospects for plate tonnage from railroads. The new cars will be built at Worcester, Mass., and the repair program reopen shops on increased schedules. Miscellaneous buying of plates is in small lots, but in spots such specifications are well maintained. Shipyards are releasing tonnage in slightly better volume and navy yard needs are substantially heavier. Heavy tank inquiry is slow.

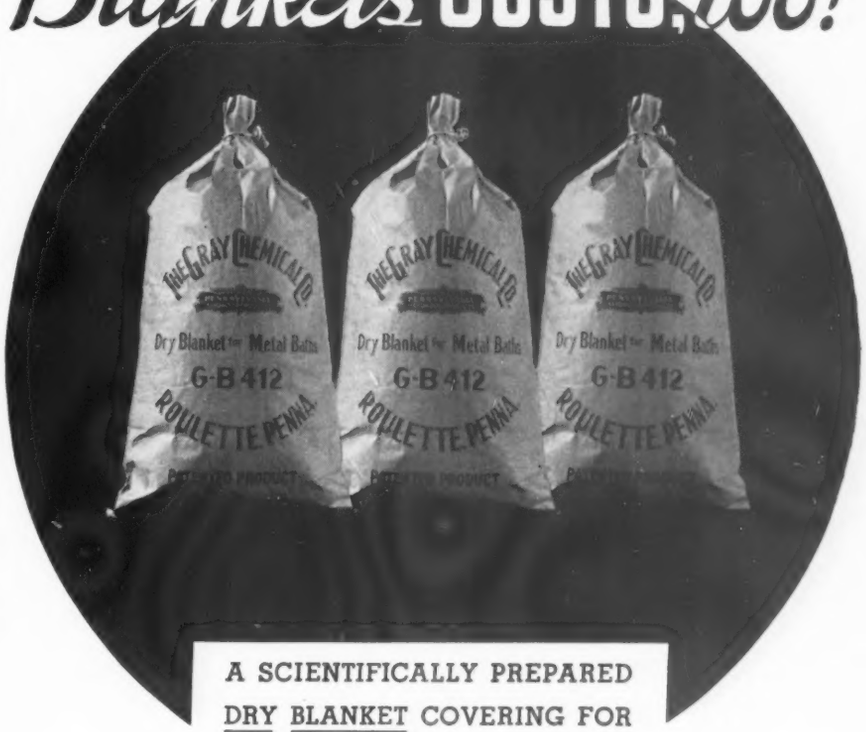
Although bids on most items were uniform, Central Iron & Steel Co., Harrisburg, Pa., is low on the larger tonnage classes involving 4450 tons of plates and sheets for delivery at Boston, Charleston, S. C., and Puget Sound, Wash., closing Feb. 4. Half the tonnage is for Boston, entering into the construction of two destroyers. Low quotation on 1250 tons of plates for Boston was 2.56c. Total tonnage of steel included in the opening called for 5782 tons in four schedules, bars and shapes also being covered in the inquiries.

New York — There is a growing accumulation of plate needs which eventually will become urgent and there may be a good spurt in miscellaneous business. So far this year the oil industry has been about the most consistent consumer of plates. Shipyards are becoming increasingly active and their requirements, in turn, will have an important effect as time goes on. Within the past week two tankers, involving a total of approximately 9000 tons of hull steel, were placed by the Socony-Vacuum Oil Co. with the Sparrows Point, Md., plant of the Bethlehem Shipbuilding Corp.

It is reported a seller here has taken 7000 tons of plates for export to Japan.

Philadelphia — Platemakers expect the maritime commission to take new bids on cargo vessels on which bids were taken recently. It

Blankets COSTS, too!



A SCIENTIFICALLY PREPARED DRY BLANKET COVERING FOR MOLTEN METAL BATHS OF ZINC, LEAD, TIN AND THEIR ALLOYS

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is understood the commission considers some builders are too high. Plate buying by railroads is practically absent, pending a decision on rates. Business is also light in other directions, including tank and structural fabricators.

Baltimore — Maryland Drydock Co., a Koppers Co. subsidiary, has received a contract for repairs requiring about 200 tons of steel to the CITY OF PHILADELPHIA, owned by the Wilson Line, Wilmington, Del.

San Francisco — Pending business is confined to relatively small tonnages. So far this year 12,696 tons have been booked, compared with only 6306 tons for the same period a year ago.

Birmingham, Ala.—Plate tonnage is spotty and buying is in comparatively small volume.

Seattle—For the second time Seattle has called bids, Feb. 17, for the Volunteer Park-Magnolia pipe line extension involving about 1800 tons of plates for 24 to 36-inch mains. Western Pipe & Steel Co., San Francisco, has the contract to fabricate an 82,000-bbl. storage tank for the Shell Oil Co., Seattle, involving about 250 tons. Commercial Boiler Works, Seattle, is building an all-welded steel cannery tender for the Pacific-American Fisheries Co., involving 70 tons plates and shapes furnished by Bethlehem Steel Co. and A. M. Castle & Co.

Plate Contracts Placed

9000 tons, principally plates, two tankers for Socony-Vacuum Oil Co., New York, to Sparrows Point, Md., plant of Bethlehem Shipbuilding Corp.

875 tons, oil tanks, Pure Oil Co., Smiths Bluff, Tex., to Chicago Bridge & Iron Co., Chicago.

250 tons, storage tank for Shell Oil Co., Seattle, to Western Pipe & Steel Co., San Francisco.

100 tons, 150,000-gallon tank and tower, Harrington, Wash., to Seattle Boiler Works, Seattle, Wash.

Plate Contracts Pending

1835 tons, mostly black welding quality, bureau of supplies and accounts, navy department, bids Feb. 21, deliveries at Boston, Portsmouth, N. H., Norfolk, Va., Brooklyn and Philadelphia.

1800 tons or more, 24 and 36-inch water system extension for Seattle; bids Feb. 17.

100 tons, water department specials for Seattle; bids soon.

Unstated tonnage, two steel-hull steam-operated maneuver boats and two steel-hull needle barges, delivery Peoria lock and dam and New Lagrange lock and dam, bids March 7, U. S. engineer, Chicago, cir. 84.

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Remember when
STEARNS introduced air cooling in magnetic pulley construction back in 1922?

Remember when
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Bars

Bar Prices, Page 78

Pittsburgh — Production of steel bars here is still slow although showing a slight upturn as more inventories become depleted. Demand is slow and steady, with much wider diversification noted. Probably the most active field at present is still farm implements.

Cleveland—Producers of alloy and steel bars report a slight increase in aggregate tonnage of orders booked so far this month. Auto partsmakers continue to order for only actual needs, reflecting absence of substantial releases from auto builders. Farm equipment manufacturers are fairly busy although they are curtailing operating schedules to coincide with revised estimates of probable spring demand. Inventories of finished parts of many consumers are still more than ample to absorb current requirements. Prices are unchanged.

Chicago — With slackening of activities of the farm implement industry, demand for bars and small shapes also has declined farther. Some bars are moving to forge shops and also into warehouse stocks. Even the railroaods are taking single carloads of bars for car repairs

in their own shops. Outstanding tonnage of bars, either carbon or alloy, is not in sight.

Boston — Alloy, forging and cold finished bars are moving steadily in small volume for current requirements, there being a spotty gain in small tool forging operations. Machinery builders, while slowing down in some lines, are still leading consumers of tool steel and special material. Carbon steel stock still drags, although warehouse inventories are light and the first substantial upturn is expected from jobbers.

New York—Steel bar consumers continue to buy only for current requirements and demand is light in practically all lines of consumption.

Philadelphia — Specifications for both hot and cold-rolled bars continue of a miscellaneous character. Warehouses are best buyers individually.

Buffalo — Even though demand for bars is in small lots, some encouragement was seen as rolling operations were quickened at two mills. One plant resumed operations with three merchant mills after a two-week shutdown, while another was planning a resumption of activity over the weekend. No special source of buying is noted, but mills resuming report scarcely any orders from automotive manufacturers.

Pipe

Pipe Prices, Page 79

Pittsburgh — Production on pipe and tubular goods is slowly increasing, being led upward by the smaller sizes. Replacements have become necessary in many sizes, by both manufacturers and jobbers. Jobbers' stocks are believed to be low. Most producers look for an abrupt rise in the spring.

Cleveland—Cast iron pipe foundries continue on substantially reduced schedules, with most sellers shipping out of stock. Most current requirements are of a public nature from small municipalities with the aid of WPA funds. James B. Clow & Sons Co., Cleveland, is low on 100 tons of cast pipe for a water distribution project for Upper Arlington, O. A similar project for Jeffersonville, O., requiring 200 tons, should be awarded soon. Prices are firm and unchanged.

Boston — Estimates are expected shortly on several thousand tons of cast pipe for a water line, Centerville-Osterville, Cape Cod, Mass., the towns involved having voted to go ahead with the project. Rockport, Mass., is also expected in the market soon for several hundred tons. Present buying, however, is largely for fill-in lots with some blanket covering for partial annual needs for shipment later. Merchant steel pipe lags with building construction light. Wrought pipe demand is also limited to small orders.

New York—Cast pipe buying has dropped to a low ebb with few inquiries calling for more than 100 tons. Some eastern foundries are less active. New Rochelle, N. Y., closes this week on a small tonnage. Bids due Feb. 10 on a department of water supply, gas and electricity project, Avenue P, Brooklyn, taking a heavy tonnage of large diameter steel pipe, were postponed until Feb. 14. Figures are also in on approximately 100 tons of small galvanized and welded steel pipe for Panama.

Birmingham, Ala.—Pipe plants are producing at approximately 40 per cent on a three and four day week basis. Some improvement in municipal lettings are reported, but most tonnages are small.

San Francisco—A slight improvement in demand is noted and several new inquiries of size have come out for figures. Awards totaled only 348 tons and brought the aggregate

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to date to 2517 tons as compared with 2386 tons for the corresponding period in 1937.

Seattle—Interest in cast iron goods is improved and several sizable projects are up for figures. Seattle has again called bids Feb. 17 for the Volunteer Park-Magnolia water system extension involving about 1500 tons or more of 12 to 20-inch cast iron.

Cast Pipe Placed

375 tons, 6 to 12-inch, for Spokane, Wash., to Pacific States Pipe Co., Provo, Utah.
165 tons, 6 and 8-inch, Concord, N. H., to R. D. Wood & Co., Florence, N. J.

Cast Pipe Pending

1500 tons or more, 12 to 20-inch Seattle system extension; bids Feb. 17.
500 tons, 6 to 10-inch, Colchester, Conn., bids in.
250 tons, 4, 6 and 8-inch and accessories, Twisp, Wash.; bids Feb. 21.
250 tons, 4 and 6-inch Class 150, King county district 3, Seattle, Wash.; bids in.
248 tons, 6 and 8-inch, class 150, Long Beach, Calif.; bids Feb. 15.
150 tons, 4 and 6-inch South Willamette district, Eugene, Oreg.; bids to W. W. Wiper, Feb. 18.
125 tons, Panama, United States Pipe & Foundry Co., Burlington, N. J., low, bids Feb. 2, 3325.
100 tons, 4 to 10-inch and fittings, for Grandview, Wash.; bids in.

Steel Pipe Pending

100 tons, small size galvanized (99,000 feet) and welded steel pipe, Panama; bids in schedule 3329.

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Finishing costs are reduced to a minimum. . . . Small parts require no nickel buffing; some large parts need light coloring only. . . . No copper buffing. . . . Cut-through rejects are eliminated. . . . The smooth, ductile nickel coating does not flake or peel.

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The ingredients of the solution do not decompose to produce undesirable products. . . . The bath operates at an efficiency of 98 per cent. . . . Highly lustrous nickel deposits are obtained over a wide range of plating conditions.

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* * *

For full information on The Udylite Process of Bright Nickel Plating, get in touch with the nearest Udylite office. *The Udylite Company, 1651 E. Grand Blvd., Detroit, Michigan—New York,* 30 E. 42nd Street; *Chicago,* 1943 Walnut Street; *Cleveland,* 3756 Carnegie Avenue; *San Francisco,* 114 Sansome Street.

FINISHING MADE EASY—This inexpensive wire soap dish is copper flashed and bright nickel plated directly on unburnished steel. The finishing operations are simple and ECONOMICAL.

50% SAVINGS—This part is buffed, copper plated (no copper buffing), bright nickel plated, light nickel wiped, then chromium plated. Elimination of operations means large direct savings.

GOOD THROWING POWER—This saucepan (8 in. dia. x 5 in. deep) is flashed with copper, then bright nickel plated. The Udylite solution deposits a bright, even coating on entire inner surface.

Wire

Wire Prices, Page 79

Pittsburgh—Estimates for February production of wire are a little better than January production, which, in turn, was an increase over December. Estimates are mostly based on the fact that merchant wire is greatly improved, due to anticipation of spring demand. Manufacturers' wire, while still slow, has shown somewhat of an increase over the past week and orders on most grades are somewhat better.

Cleveland—Demand for wire and wire products is substantially unchanged. New business represents only actual needs and is for prompt shipment. A slight improvement is noted in certain merchant wire products from dealers in agricultural centers, preparatory to peak spring demand. New business from auto suppliers continues in the doldrums, although it is confidently expected that this condition should show some improvement soon. Average operating schedules in most instances are said to range between 20 and 30 per cent. Prices are unchanged.

Chicago—Some disappointment has been visited upon wiremakers in that the usual pre-spring movement of wire products now due has been absent. Inquiry develops that orders now in mill hands are being held up by distributors awaiting the outcome, or at least more clearly discerning, spring trade prospects. Some rural distributors are taking into stock considerable wire against expected spring business, but the volume is not what was hoped for. Manufacturers' wire, one of the wire mills' standbys, also is having its ups and downs in the volume of new business. Arrival of more permanently wide-open weather may change this somewhat drab picture.

Boston—While widely diversified production of wire products in this district tends to maintain operations slightly above the country as a whole, there has been no general improvement in buying and finishing schedules are unchanged. Specifications are spotty and cover numerous specialties for prompt delivery, but individual releases are small with business traceable to the automobile industry notably dull. The textile trade is also lagging. Wire rod demand is slow with mills

dependent on outside sources for supplies still well stocked as a rule based on current operations.

New York—About the best that can be said of wire buying is that the recent improvement in merchant products is maintained, with a spotty gain in manufacturers wire. The latter is not impressive, however, and varies from day to day. Light orders for rope and heavier goods is unchanged while electrical material, including cable is mixed. Rod buying continues light. Practically all buying is in small lots for prompt shipment.

Birmingham, Ala.—Some slackening in recent improvement in demand for wire products is evident. Demand, however, is somewhat better than a few weeks ago.

Rails, Cars

Track Material Prices, Page 79

While hearings have just been concluded, traffic men do not look for a rate decision by the interstate commerce commission much before another month, if then; nor an increase, if it is decided upon, much before April 1. Some look for a still later effective date.

In any event it appears that those who anticipate an early important revival in railroad equipment buying as a result of a favorable decision are due for disappointment. Moreover, it is believed railroads generally will hold off still longer until they have gained some benefit from higher rates.

Meanwhile, new inquiry is featured by a list of 500 box cars, 100 hopper cars and 50 rack cars, by the Bangor & Aroostook.

Domestic freight car bookings in January, involving a single order for 25 cars, were the lightest for any month since May, 1935, when only two cars were placed. January business compared with 275 cars in the preceding month and also with 275 in November. Further comparisons follow:

	1938	1937	1936	1935
Jan.	25	17,806	2,050	24
Feb.		4,972	6,900	806
March		8,155	632	0
April		9,772	4,427	350
May		4,732	8,900	2
June		548	5,200	5,151
July		1,030	7,229	500
Aug.		1,475	225	200
Sept.		1,216	1,750	875
Oct.		1,355	2,210	1,250
Nov.		275	1,550	100
Dec.		275	23,450	10,050
Total		51,611	64,643	19,308

Car Orders Placed

Navy, Washington, one 50-ton freight car to General American Car Co., Chicago.

Locomotives Placed

New York, New Haven & Hartford, six diesel-electric switch engines, to American Locomotive works, New York; four others yet to be placed.

Car Orders Pending

Bangor & Aroostock, two baggage cars; bids asked.

Bangor & Aroostook, 500 box cars, 100 hopper cars and 50 rack cars, bids asked.

Navy, bureau of supplies and accounts, one 50-ton, 30-foot steel twin hopper car, delivery Washington, bids Feb. 21, schedule 2814.

Metallurgical Coke

Coke Prices, Page 79

Production of beehive coke has dropped off considerably as local markets continue inactive. Inquiries are infrequent, with some deliveries being made on previous contracts. Coke stocks in many cases are still adequate for present production rates.

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Behind the Scenes with STEEL

Mathematics 101

■ And now we don our bragging suit and point to our periodical's table of district steel rates which appears each week. That this table is accurate right down to the doggone-little-difference*th* degree we hereby prove by the following figures:

Percentage of Open-Hearth Ingot Capacity

Averages	Steel's estimate	A. I. & S. Inst. figures	the diff.
Aug. ...	83.60	83.79	.19
Sept. ...	76.77	76.52	.25
Oct.	59.46	58.31	1.15*
Nov.	37.54	38.22	.68
Dec.	25.62	25.36	.26
Jan.	29.14	29.35	.21

*Exception proving rule that STEEL is always within one point of accuracy.

Taking you behind the scenes we find that our G. H. "Doc" Manlove is the swami responsible for these uncanny estimates. He has some kind of cold, calculating system, into which many figures are thrown, a mental crank turned and out come the answers. Still there's a human element involved, and if Doc, with his years of experience, has a hunch the figures aren't quite right, he'll toss in an extra tenth or hundredth of a point. Needless to say, we're really impressed by this system and—er, ah, Doc, how about that third race at Santa Anita this afternoon?

Lest We Forget

■ This week, for a change, the technical section leads off with Progress in Steelmaking because of the worthiness of T. N. Keelan's article on the annealing of cold strip. This opus has caused us no little bit of awe, not only because of the wealth of information contained in it, but because of the complexity of the type faces, inserts, tables and charts involved in setting the whole thing up. First we were awed by the way Associate Editor J. D. Knox pieced it all together and so carefully checked and edited it. After a Pastepot Editor got the dummy assembled, we were awed by the way Irwin Hudak, down there in the composing room, performed typographical sleight-of-hand and made it all come out to an even five pages and with everything in its proper place. At the end of the article, set in type, we had noticed a cryptic little message from Mr. Knox to whomsoever it might concern: "Don't forget—five inserts, three tables, two charts." And last night we were suddenly snatched from the arms of Morpheus with the awful realization that we hadn't seen that little message deleted from the final proofs. We visioned America, on Monday morning, puzzling and chuckling over the informal postscript. Then we decided what the hell, and rolled over to snatch our customary four hours' sleep. Anyway, when you read that fine article, don't forget—five inserts, three tables, two charts.

Emperor Jones

■ Vertex Co.'s petite but useful little sheet binder pictured on page 60 of STEEL, issue of January 31, drew a lot of inquiries. The RSD rushed a man to our cubicle to get the correct address for inquiring readers. We immediately went into a transom, gazed into our crystal ball, and admitted, with a slight foolish feeling, that it was 5 Great Jones street. The RSD man went away muttering something about asking a civil question and not getting a civil answer. Nevertheless, 5 Great Jones street it is, and 5 Great Jones street it will remain—even in answer to such formal notes as the one from the Naval Aircraft Factory, United States Navy Yard, Philadelphia, that began: "Subject: Sheet Binder—Information concerning. Reference: (a) January 31, 1938, etc." Answer, their question to, we gave.

—SHRDLU

—The Market Week—

Shapes

Structural Shape Prices, Page 78

New York — Poirier & McLane Corp., New York, is low on the general contract, Long Island railroad bridge, Lynbrook, N. Y., taking 5900 tons. On the steel work direct, fabricating and erecting, Bethlehem Fabricators Inc., Bethlehem, Pa., is low on two public school additions, New York, 478 tons. New inquiry is slack and awards have dropped, the bulk of pending work on which bids are in having been closed. George F. Driscoll Co., Brooklyn, N. Y., has been awarded the general contract for the Canal Street post office, New York.

Pittsburgh—Both inquiries and awards are quite small, with only a slight change from the preceding week. Allegheny county, Pennsylvania, has inquired for 5000 tons to be used in the new Highland park bridge, Pittsburgh, and Ford Motor Co. has inquired for 600 tons to be used in the new open-hearth furnaces at Dearborn, Mich.

Cleveland — Structural inquiries and awards have shown only moderate improvement over the last 30 days. Few private concerns are advancing expansion programs already on paper. The largest award, 1200 tons for an annealing shop building at Middletown, O., for the American Rolling Mill Co., was reported as going to Joseph T. Ryerson & Son Inc., Chicago. Fort Pitt Bridge Works, Massillon, O., was awarded 500 tons for a bridge in Hamilton county, Ohio. New bids are due Feb. 15 for a bridge at Toledo, O., requiring 300 tons. Fabricated prices are still below the market in a number of instances, but mill prices are unchanged.

Boston—Bids on structural steel, upwards of 3000 tons for the surgical building, Massachusetts general hospital, Boston, go in Feb. 24, the material to be placed through the general contractor. Inquiry, which is slightly heavier, also includes an

Shape Awards Compared

	Tons
Week ended Feb. 12	**8,748**
Week ended Feb. 5	**10,264**
Week ended Jan. 29	**16,507**
This week, 1937	**30,470**
Weekly average, year, 1937	**16,060**
Weekly average, 1938	**14,251**
Weekly average, January ..	**17,978**
Total to date, 1937	**205,894**
Total to date, 1938	**99,760**

Includes awards of 100 tons or more.

engine and machine shop for the Boston Elevated railroad. About 1200 tons pend for school buildings and public work accounts for the bulk of estimates with bridge requirements small.

Philadelphia — New bids will be taken Feb. 15 on the Potomac river bridge, Hancock, Md., involving 2600 tons in addition to miscellaneous material. Inquiries likewise included about 2500 tons for Mellon art museum, Washington. Several fair sized jobs are also active for Pennsylvania state program. Private work is still slack.

San Francisco—The two largest structural lettings called for 250 tons for a high school auditorium at Ontario, Calif., placed with Consolidated Steel Corp. and 233 tons of upset rods and miscellaneous steel for the United States engineer office, Los Angeles, taken by Bethlehem Steel Co. Bids have just been opened on from 1700 to 5000 tons of sheet steel piling for the improvement of the waterfront in Alameda, Calif., for the navy department and on 890 tons of sheet piling for the bureau of reclamation for delivery at Blaisdell, Ariz. Awards totaled 1564 tons and brought the aggregate for the year to 6959 tons, compared 17,350 tons last year.

Seattle — Reclamation bureau opened bids Feb. 9 at Denver, for 30 bulkhead gates for the Coulee project and on the same day at Yakima, Wash., for the Yakima Ridge canal, Wash., involving 225 tons tunnel supports. Business pending includes 600 tons of steel piling for a Washington state bridge on the Columbia river, also several reclamation project units, bids in at Denver.

Shape Contracts Placed

1300 tons, annealing and shipping building, American Rolling Mill Co., Middletown, O., to Joseph T. Ryerson & Sons Inc., Chicago, through F. H. McGraw Co., Middletown.

660 tons, pump and blower house, sewage disposal plant, Tallmans Islands, New York, to Ingalls Iron Works, Birmingham, Ala.; through Caye Construction Co., New York.

565 tons, high school, Bay Shore, N. Y., to Harris Structural Steel Co., New York; through Bowe Construction Co., New York.

510 tons, oil derricks, Corpus Christi, Tex., to Muskogee Iron Works, Muskogee, Okla.

500 tons, junior high school, Mt. Lebanon, Pa., to Reliance Steel Products Co., Pittsburgh.

420 tons, Hamilton county bridge, to Fort Pitt Bridge Works, Massillon, O.; Pinkert Construction Co., Cincinnati, general contractor.

379 tons, St. Louis board of public service, to Carnegie-Illinois Steel Corp., Pittsburgh.

375 tons, building, hospital for joint diseases, New York, to Harris Structural Steel Co., New York.

335 tons, manufacturing plant, Boston Steel Construction Co., Baltimore, to Belmont Iron Works, Eddystone, Pa.

330 tons, highway bridge FAP-98, Washington county, Alabama, to Virginia Bridge Co., Birmingham, Ala.

310 tons, theatre and store, Seventy-second street and Broadway, New York, to Drier Structural Steel Co., New York.

300 tons, boiler house, Columbus, O., to Case Crane & Engineering Co., Columbus, O.

290 tons, addition, public school 89, Bronx, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa.; bids Feb. 8, steel direct, fabricating and erecting.

250 tons, high school auditorium, Ontario, Calif., to Consolidated Steel Corp., Los Angeles.

233 tons, upset rods and miscellaneous steel, United States engineer office, Los Angeles, to Bethlehem Steel Co., Los Angeles.

205 tons, addition and alterations, orphans school, Scotland, Pa., to Phoenix Bridge Co., Phoenixville, Pa.

200 tons, wide flange column sections, North Beach airport project New York, to Belmont Iron Works, Philadelphia; through state procurement officer.

190 tons, ore spouts, Great Northern railway, Allouez, Wis., to American Bridge Co., Pittsburgh.

188 tons, addition, public school 32, Queens, N. Y., to Bethlehem Steel Fabricators Inc., Bethlehem, Pa.; bids Feb. 8, steel direct, fabricating and erecting.

175 tons, highway project, Woodbridge, N. J., to Bethlehem Steel Co., Bethlehem, Pa.; through Franklin Construction Co., Newark, N. J.

165 tons, special troop armory, Philadelphia, to Keystone Structural Steel Co., Trenton, N. J.

165 tons, shapes and bars, state hospital building, Norton, Kans., to Topeka Iron & Foundry Works Co., Topeka, Kans., and Ceco Steel Products Co., Omaha; W. R. Grimshaw Co., Tulsa, Okla., general contractor.

155 tons, armory, Allentown, Pa., to Bethlehem Contracting Co., Bethlehem, Pa.

153 tons, highway bridge over spillway, Fresno dam, Milk river project, Alabama, bureau of reclamation project, Montana, to Joseph T. Ryerson & Son

PAGE
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Inc., Chicago, specification 1020-D, bids Feb. 1.

150 tons, steel doors for Sand Point naval hangar, Seattle, to Truscon Steel Co., Youngstown, O.

110 tons, girders, reinforcing tube mill, Economy, Pa., Fort Pitt Bridge Works, Pittsburgh.

100 tons, state armory, Coraopolis, Pa., Pittsburgh-Des Moines Steel Co., Pittsburgh.

100 tons, shapes and joists, Searle high school, Great Barrington, Mass., to Haarmann Steel Co., Holyoke, Mass., and Truscon Steel Co., Youngstown, O.; L. D. Phillips Construction Co., Inc., Westfield, Mass., general contractor.

100 tons, addition, Grover Cleveland school, Washington, to Dietrich Bros., Baltimore; M. Wirtheimer & Co., Washington, general contractor. Rosslyn Steel Co., Rosslyn Va., awarded reinforcing steel.

Shape Contracts Pending

12,695 tons, shafts and tunnels, West Branch-Kensico section, Delaware aqueduct, Putnam and Westchester counties, New York, for board of water supply, New York; being rebid under three contracts Nos. 322 to 324 inclusive. First contracts opened Nov. 9 rejected. Of total tonnage 10,770 tons is structural and the remainder plates, reinforcing bars, piling and pipe.

5900 tons, bridge, Long Island railroad, Lynbrook, N. Y.; Poirier & McLane Corp., New York, low on general contract.

5000 tons, Highland park bridge, Pittsburgh, for Allegheny county, Pennsylvania.

2500 tons, bridge, Potomac river, Hancock, Md.; bids rebid Feb. 15, also takes 600 tons reinforcing bars.

890 tons, sheet piling, bureau of reclamation, invitation 24,608-A. Blaisdell, Ariz.; bids opened.

600 tons, material for open hearth furnaces, Ford Motor Co., Dearborn, Mich.

590 tons, for State of Illinois highway bridges; bids February 8.

500 tons, derricks, Lyons Pins, Kans.

500 tons, health buildings, Washington Heights and lower east side health and teaching centers, New York; bids Feb. 24.

450 tons H-piling, Washington-Idaho bridge, bids at Olympia, March 1.

450 tons, two buildings A. & M. college, Stillwater, Okla.

400 tons, coaling station, Ogle Construction Co., Harrisburg, Pa.

400 tons, steel curbing, New York Central railroad.

400 tons, building, Shrine of North American Martyrs, Auriesville, N. Y.; Boehon Bros. Inc., Buffalo, low.

325 tons, school, Hadley, N. Y.

325 tons, building, Union Industries, Inc., Stamford, Conn.

250 tons, U. S. Engineers, dam No. 1, Tuscaloosa, Ala.

240 tons, roller skating rink, Garden Roller Skating Rink Co., Trenton, N. J.

225 tons, tunnel supports, etc., Yakima Ridge canal, Roza project; bids in at Yakima, Wash.

220 tons, underpass Grand avenue at 55th street, Birmingham, Ala.

200 tons, shapes and castings spillway bridge, Fresno dam, Mont.; Jos. T. Ryerson & Sons., Inc., Chicago, low.

200 tons, plant expansion, Linderme Tube Co., Cleveland; project put off for about 30 days.

200 tons, Home for Aged, Roman Catholic church, Fall River, Mass.

200 tons, highway bridge, Carroll, Iowa.

170 tons, state bridge, Paddy creek, Lawrence county, Ohio.

150 tons, ward and service building, state hospital, Grafton, Mass.

150 tons, state highway bridge FA route 153, section 11-B, Rushville, Ill.

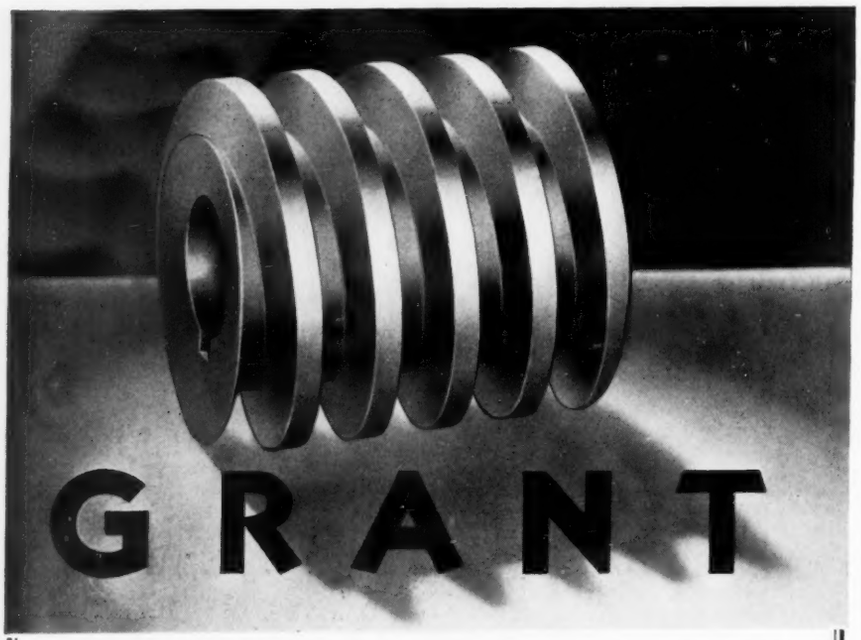
120 tons, supporting structures, specification 1031-D, bureau of reclamation, Boulder City, Nev.

110 tons, overpass, 120-foot through truss, Barnet, Vt.; bids Feb. 25, Montpelier, Vt.

100 tons, state highway bridge FA route 158, section 6-B, Pleasant Hill, Ill.

Unstated, 30 bulkhead gates for Coulee project; bids in at Denver.

Unstated tonnage, engine and machine shop, Boston elevated railroad, Boston.



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Reinforcing

Reinforcing Bar Prices, Page 79

New York—Bids are in on ramps and approach, contract WB-6, Bronx-Whitestone bridge, New York, taking 625 tons of reinforcing steel, but new inquiry is light and awards few. Figures go in next week on 500 tons for the Queens land section, East river tunnel. Contract WB-6 will be the last, covering Triborough Bridge authority contracts for the Whitestone bridge, the remainder to be handled through Madigan & Hyland, engineers.

Cleveland—Tonnage of reinforcing bars and joists during January, for private projects in Northern Ohio, on which estimates were requested, totaled 209 and 177 tons, respectively. This compares with 173 tons of bars and 174 tons of joists during December. School requirements continue to absorb most of the joist tonnage, and bar needs are scattered among a number of small industrial expansion projects. No material improvement is noted in the local reinforcing bar price on fabricated material.

Boston—Active reinforcing tonnage pending is not estimated above 1000 tons with bids in on 300 tons for an administration building, Har-

Concrete Bars Compared

	Tons
Week ended Feb. 12	**5,570**
Week ended Feb. 5	**5,931**
Week ended Jan. 29	**5,211**
This week, 1937	**4,858**
Weekly average, year, 1937	**6,266**
Weekly average, 1938	**5,815**
Weekly average, January..	**6,446**
Total to date, 1937	**21,152**
Total to date, 1938	**40,705**

Includes awards of 100 tons or more.

vard university, Cambridge, a leading inquiry. Buying is confined mostly to small lots. Highway and bridge programs in the six New England states are uncertain. Last year Massachusetts spent $6,279,391.19 on such work exclusive of Metropolitan district commission and miscellaneous contracts.

Pittsburgh—Awards are quite small and new inquiries do not show any particular activity. Producers are marking time, waiting for action on contemplated projects.

Philadelphia — Other than Pennsylvania state work which continues to come out steadily, district fabricators are figuring on few jobs of any consequence. Largest private project pending is Lit Brothers department store warehouse taking 1200 tons. Relatively little industrial construction and remodeling is under way or contemplated.

San Francisco—Although new inquiries continue to come forth slowly for figures, a sizable tonnage was placed and aggregated 3741 tons. This brought the total for the year to 16,969 tons compared with 4052 tons in 1937. The two largest projects involved 1035 tons for the bureau of reclamation for delivery at Knob, Calif., and 470 tons for the Kapalama drainage district, Honolulu, both placed with Bethlehem Steel Co.

Seattle—Inquiry is slow, awards consisting of small tonnages for schools. Mill operations are on reduced schedule. The week's only award went to Bethlehem Steel Co., Seattle, 120 tons for the Wenatchee, Wash., high school. Bids were opened Feb. 10 at Cody, Wyo., for the Heart Mountain canal irrigation project, involving 700 tons. Largest tonnage pending involves about 700 tons for the Washington-Idaho bridge at Olympia, March 1.

Reinforcing Steel Awards

1035 tons, bureau of reclamation, invitation A-42,459-A, Knob, Calif., to Bethlehem Steel Co., Los Angeles.

470 tons, Kapalama drainage district, Honolulu, T. H., to Bethlehem Steel Co., Seattle, Wash.

400 tons, addition to state capitol building, Phoenix, Ariz., to Allison Steel Co., Phoenix, general contractor.

370 tons, sewage disposal system, sludge digestion tank, and gas holder, Detroit, to Ceco Steel Products, Omaha, Nebr.

363 tons, 4-story city hall and jail, Fort Worth, Tex., to Ceco Steel Products Co., Dallas, Tex.; J. T. Taylor, Fort Worth, general contractor. Fort Worth Structural Steel Co. awarded structural steel.

265 tons, navy, delivery Norfolk, Va., to Hall-Hodges Inc., Richmond, Va.

250 tons, Panama schedule 3325, to Capitol Steel Corp., New York.

220 tons, science hall, Kansas state college, Manhattan, Kans., to Concrete Engineering Co., Omaha, Neb.; Olso Construction Co., Lincoln, Neb., general contractor. Lincoln Steel Works, Lincoln, awarded 52 tons structural steel.

180 tons, Veterans administration building San Fernando, Calif., to unnamed interest.

175 tons, Chaffey high school auditorium, Ontario, Calif., to Consolidated Steel Corp., Los Angeles.

170 tons, bars and shapes, buildings, state teachers' college, Maryville, Mo., to St. Joseph Structural Steel Co., St. Joseph, Mo., and Ceco Steel Products Co., Omaha; J. E. Dunn Construction Co., Kansas City, Mo., general contractor.

170 tons, commercial testing laboratory, Chicago, to Inland Steel Co., Chicago, through Joseph T. Ryerson & Sons Inc., Chicago.

150 tons, high school, Silver City, New Mex., to unnamed interest.

150 tons, state highway project route 25, section 7A, Union and Middlesex counties, New Jersey, to Stulz-Sickles Co., Newark; J. Nesto & Co., Newark, general contractor.

150 tons, first unit, Richland district high school, Columbia, S. C., to Southern General Fireproof Co., Atlanta, Ga.; Mechanics Contracting Co., Columbia, general contractor. Southern Engineer Co., Charlotte, N. C., awarded 70 tons, structural steel.

150 tons, addition to Y. M. C. A., Honolulu, T. H., to unnamed interest.

150 tons, WPA requirements, procurement officer, treasury department, New York, to W. Ames & Co., Jersey City.

130 tons, Indiana women's prison, Indianapolis, to Inland Steel Co., Chicago; through W. J. Holliday, Indianapolis.

120 tons, high school, Wenatchee, Wash., to Bethlehem Steel Co., Seattle.

102 tons, bridge, on Yerba Buena Island, San Francisco, to Soule Steel Co., San Francisco.

100 tons, Stephen Lee apartment building, Madison, Wis., to Bethlehem Steel Co., Bethlehem, Pa.; through Kupfer Foundry & Iron Works, Madison, Wis.

100 tons, Western State Teachers college, Kalamazoo, Mich., to Calumet Steel Co., Chicago.

100 tons, building for Armstrong Cork Co., South Gate, Calif., to unnamed interest.

100 tons, bars and shapes, dairy building, University of Georgia, Athens, Ga., to Southern General Fireproof Co. and Calvert Iron Works, both Atlanta; A. K. Adams, Atlanta, general contractor.

Reinforcing Steel Pending

1376 tons, Gila project, Blaisdell, Ariz., 1160 tons; Rutledge, Tex., 155 tons; and Salt river project, Phoenix, Ariz., 61 tons; bureau of reclamation invitation 24,605-A.

1300 tons, bridge, Long Island railroad, Lybrook, N. Y., Poirier & McLane Corp., New York, low.

700 tons, Heart mountain canal, Shoshone project, Wyo.; bids in to reclamation bureau at Cody, Wyo.

625 tons, ramps and approaches, Bronx-Whitestone bridge; Lynn avenue Construction Co., Long Island City, N. Y., low; bids Feb. 9 to Triborough Bridge authority.

265 tons, Norfolk navy yard requisition, Norfolk, Va.; Hall-Hodges Inc., Richmond, Va., low bidder.

208 tons, levees, walls and miscellaneous

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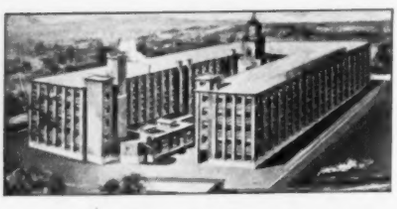

ESTABLISHED 1875

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INCORPORATED
ALLENTOWN, PENNSYLVANIA

work, Rome, Ga., bids March 7, U. S. engineer, Mobile, Ala.; work also takes 400 tons steel sheet piling and steel bearing piles.

170 tons, hydro-electric plant, Merrill, Wis.

100 tons, bureau of reclamation, invitation 36,291-A, Homedale, Ida.; bids Feb. 14.

Pig Iron

Pig Iron Prices, Page 80

Pittsburgh—Pig iron markets here continue quiet and inactive, with producers indicating they do not expect any marked improvement soon. Buying is still largely hand to mouth, with buyers securing iron only for immediate needs, and few if any attempts are being made to build up stocks.

Cleveland — Pig iron producers note little change in general run of miscellaneous orders, consisting of carlots and for prompt delivery. Tonnage booked so far this month is somewhat more than the comparable period during January. Little new business is appearing as most foundries still have considerable tonnage on producers books carried over into this quarter. Prices are unchanged.

Chicago — Shipments of pig iron from local furnaces continue slow. Most tonnage consists of malleable and foundry grades. Foundries are operating only two and three days a week.

Boston—There has been no definite improvement in foundry operations which in few instances are up to 40 per cent of capacity. Dullness is reflected in continued light buying of pig iron in small lots by consumers with meager stocks. Practically no volume has been booked for shipment beyond next month and consumers as a rule are making no effort to build up inventories. Most larger users, notably textile mill equipment builders, still have ample supplies based on current operations. Arrivals of foreign iron, including 800 tons of Indian last week, would indicate more imported iron is being bought than generally supposed.

New York—With little pressure for castings most consumers of pig iron continue to mark time and current buying is confined to occasional small lots for immediate use.

Buffalo—Further shrinkage in foundry inventories is indicated by the increased total of small pig iron orders. Tonnage volume remains considerably below normal. Buying from the automotive industry and railroads continues to lag as malleable melt stays at a low ebb. Orders are highly diversified. Shipments for the month are about on par with January, but above December. Seven out of 15 stacks are active.

Philadelphia—Sellers report better releases against contracts but new business is confined to a few spot cars. Practically all of the smaller consumers have permitted inventories to drop extremely low but see no reason to place commitments at this time. Some European demand is noted but prices offered are not attractive.

Cincinnati — Shipments of pig iron show moderate improvement. This is considered, however, no reflection of a heavier melt but rather exhaustion of more foundry inventories. Most specifications are for rush shipment. New buying is for carload lots, with many melters uninterested in further purchasing this quarter because of previous coverage.

St. Louis—Shipments of pig iron this month are about 6 per cent above the January rate. There is little change in the melt, and the higher rate of shipments is occasioned by the fact that a number of melters are low on stocks. Aside from the farm implement industry, which is operating at about two-thirds capacity, activities continue at a low ebb. Jobbing plants are running only from two to three days per week.

Steel foundries are rapidly exhausting backlogs, and do not look for additional business until railroads come into the market. Outlet through the building industry is narrow, but the outlook is brighter. Virtually all stove foundries are down. Activities are confined to repair operations. Stocks of stoves in distributors hands are reported large in many instances, particularly among mail order houses.

Birmingham, Ala.—The pig iron market remains comparatively quiet with some recession noted. The district lost one furnace and gained another this week when Woodward added a furnace and Sloss-Sheffield banked one.

Toronto, Ont.—Merchant pig iron sales showed minor tapering off during the week with awards down to 1500 tons. Melters were covered for spot needs and new buying was confined to a few users. Local blast furnace representatives, however, look for increase in sales during the next week or ten days. There has been no falling off in the daily melt, holding around 70 per cent. Some forward delivery contracts were closed within the past two weeks, involving 1500 tons, and deliveries against contract are holding up to schedule. Some improvement also is reported in inquiries. Production continues about 65 per cent of the total blast fur-

nace capacity. Prices are firm and unchanged.

Scrap

Scrap Prices, Page 82

Pittsburgh — Quietest scrap market in many years is still holding. Sales at $14.50 have been rumored, but $14 is the common price. Scrap is still scarce, with recent offerings all going for export. In view of this scarcity and continued steel operating rates approximating 30 per cent, it seems to be only a question of weeks before scrap prices will rise. Recent railroad lists were reported to have sold at $16.50, eastern seaboard, for export, approximately $2 over local quoted prices. Specialties sold off, with a resulting weakness in local quotations on these items, although prices remain strictly nominal.

Chicago — Readjustment downward in quotations on several grades of iron and steel scrap has followed sales of small quantities that in ordinary stages of the market here would have been considered negligible. These reductions for the most part are 25 cents a ton, but cast borings and machine shop turnings are down 50 cents.

Boston—Scrap prices, especially cast grades for district delivery, have weakened and are 25 to 50 cents a ton lower in some instances. The drop in stove plate for domestic shipment has been even sharper and heavy melting steel for dock delivery, export, is off 50 cents on most new tonnage arriving. Brokers are paying $14, dock, for No. 1 and $13 for No. 2, with the supply of the latter more ample. Sales of stove plate at $10 and slightly under, delivered, have been made. This weakness in prices developed after several weeks of firm and slowly rising quotations. Domestic shipments are light, most activity being in exports against old orders.

Buffalo — Weakness prevails in the scrap market as the principal consumer has no difficulty obtaining No. 1 heavy melting steel at $13 a ton. The bid has been offered to the mill's regular dealers only, in order to relieve distress from surplus stocks caused by the recent embargo on shipments. The mill reports about 17,000 tons has been received thus far, with 250 to 700 tons arriving daily.

Philadelphia—A weaker tendency doubtless would be shown in scrap, especially in steelmaking grades, were it not for the brisk export demand. Several interests are buying in this area against old and recently placed orders. Brokers are paying $15 for No. 1 steel and some are offering more where necessary to obtain desired tonnage quickly. No. 2 for export is holding at $14. Domestic demand continues at a practical standstill with further holdups noted in some directions. Reports are heard that odd lots of No. 1 steel might be had at $14.50 but brokers are also paying this against contracts. Several specialty grades are down 50 cents and a number of others are almost purely nominal in absence of demand.

New York—Dullness continues in domestic buying of steel scrap and less snap is evident in export activity, with prices unchanged for dock delivery. Sentiment is less buoyant, with foundry and steel grades for eastern consumption sluggish, although there has been some small buying of rails for rolling.

Recent scattered purchases by Japan are estimated at 40,000 tons. These orders have been made in individual cargo lots on both the Atlantic and Pacific coast. Sellers in the former district report prices paid for No. 1 melting steel were as low as paid by the European cartel, which was first reported to be $16.50 f.a.s., but are now believed to be below that figure.

Detroit—With the leading consumer still out of the market scrap buying continues to be practically absent. Current prices mean little, but general opinion appears to be that there would be little significance in a movement either way.

Cincinnati — Without mill buying, the iron and steel scrap market continues dull. Pittsburgh district prices attracted a small tonnage of No. 2 steel, for barge shipment. So little of the Louisville & Nashville railroad list of 6000 tons is expected in this district that prices will not be tested thereby. The current list includes 2000 tons of rails and 2300 tons of wheels.

St. Louis—The market for iron and steel scrap is inactive, with prices decidedly easy, and specific reductions being recorded on a number of important grades, including heavy melting steel. Dealers report a large portion of orders are frozen, mills and foundries are holding up shipments or taking material in dribbles. New buying is virtually nil, and no improvement is looked for until the railroads are in a position to purchase. Mills in this area are largely dependent upon business from the carriers.

Birmingham, Ala.—Scrap buying, especially steel scrap, continues at a minimum. Some tonnage is being acquired in cast by pipe plants and foundries and prices, in the main, are wavering downward.

Seattle—Two additional full cargo lots for Japan have been closed, the freight being about $5.25. Export

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credits are easing and shippers look for a gradual increase in Oriental buying. Seattle opened bids Feb. 9 for the sale of 300 tons of scrap street railway rail. Rolling mills are out of the market and domestic sales are unimportant. Nominally, in the absence of open sales, prices are unchanged at $7.50 and $8.

Toronto, Ont.—Trading in iron and steel scrap continues specialized with only limited tonnages moving out of dealers' yards. Steel mills in the Hamilton area continue to take heavy melting steel and turnings but dealers are offering only limited tonnages. Improvement in supplies is expected in the spring, when accumulations in the rural districts will be thrown on the market. Local dealers state that little scrap is going into yards.

Foundries are in the market for machinery cast and stove plate but supplies available for resale still are scarce and consumers are still filling in with pig iron. Prices are unchanged.

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Warehouse

Warehouse Prices, Page 81

Cleveland—Warehouse distributors report total sales so far this month have shown a moderate improvement over the comparable period during January. The increase is of a general nature resulting from a moderate improvement in operations among customers. Inventory position of most distributors remains comparatively low, but in a few instances a moderate increase in buying for stock has been noted. No change has been made in prices.

Chicago — Volume of business now current among Chicago district iron and steel warehouses is below that for the corresponding period a year ago. There continues a routine amount of warehouse trade with no finished material outstanding in its market importance.

Announcement yesterday by important mills of a $4 reduction in the price of standard No. 20 gage cold-rolled to auto partsmakers, today has been followed here in the warehouse market. Standard 20-gage cold-rolled, 24 inches and wider, now are 5.05c; stretcher level, 20-gage, are 5.65c; and deep-drawing, 20-gage, are 5.30c. Other quotations remain unchanged.

Philadelphia—Jobbers expect to follow the mill reduction on cold sheets. Sales, while slightly less active, are holding up fairly well since many consumers are gearing steel buying to day-to-day needs. According to present indications, February business will not be much below that of January.

Cincinnati — Jobbers are receiving more inquiries for building materials, as if in augury of a pickup in construction when more favorable weather arrives. Orders from industrial users are more frequent, volume tending up moderately from January levels. Reinforcing bar prices have firmed.

St. Louis — Warehouse business continues quiet, with purchasers taking only what is immediately required. Orders are generally of small size individually, but the large number of directions for rush deliveries indicate a low position of consumer stocks. Irregular mill schedules have diverted some tonnage to the jobbers. Coal mines are less active buyers than usual. Movement of wire and wire products to the country is in smaller volume than at this time a year ago. Demand for oil country goods, particularly drilling items, is well sustained. Prices on all standard materials remain steady.

Buffalo — Warehouse distributors report uncertainty is restricting consumers' buying. A general tendency to hold off and await developments dominates business. Sales are holding around the previous slow pace on fill-in buying.

Tin Plate

Tin Plate Prices, Page 78

New York — Following some fair specifications recently from certain larger consumers for delivery in March and April, buying of tin plate has slumped. However, a generally expanding market is expected over the next several weeks, as consumers work off the carry-over tonnage from last year. Export demand for tin plate disappointing.

Pittsburgh — Increase in demand for tin plate for export, with general increase in demand from a variety of domestic sources, has strengthened tin plate operations. Hot mill operations have absorbed most of the increase, with last week's production much better than average. Cold mills, however, are still slow without much increase anticipated. Miscellaneous consumers and jobbers are buying somewhat more actively, probably in anticipation of better business in the spring.

Cold Finished

Cold Finished Prices, Page 79

Pittsburgh — Lack of automotive demand continues to hold production of cold-finished steel down. Other aspects of the picture, however, have brightened the outlook somewhat. Certain farm implement specialties are still being produced in enough quantity to maintain activity. Most cold-finished business is widely diversified and indicates low stocks. Producers are somewhat more optimistic than previously about possibilities of spring business.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 79

Business in nuts and bolts seems currently to be confined to routine shipments. New business is practically negligible. Agricultural im-

plement makers have not resumed their brisk buying, which was a feature of the nut and bolt trade early last fall; but this is between seasons largely for this implement trade with resumption in part in anticipation of spring farm trade. Apparently no important railroad has thought of opening negotiations for spring supplies of track bolts.

Iron Ore

Iron Ore Prices, Page 82

Cleveland — Receipts of iron ore at lower lake ports for the 1937 season, shipments to interior furnaces, and dock balances on Feb. 1, 1938 follow:

	Receipts	Shipments	Dock Bal. Feb. 1, '38
Buffalo	5,851,276	738,109	120,557
Erie	2,745,295	2,516,672	286,287
Conneaut	9,635,048	8,969,896	1,943,354
Ashtabula	6,572,771	5,606,653	1,719,709
Fairport	1,904,419	1,830,850	480,218
Cleveland	10,082,766	7,306,049	787,555
Lorain	3,914,834	1,632,816	256,951
Huron	967,617	954,932	217,175
Toledo	1,923,960	1,171,167	62,951
TOTAL	43,597,986	30,727,144	5,874,757
Year ago	31,431,020	24,658,750	3,761,226

Steel in Europe

Foreign Steel Prices, Page 81

London—(*By Radio*)—Production of steel and iron in Great Britain continues at a high level. Steel ingot output in January was 1,081,400 tons, 22,400 tons under the December total but not materially lower than the alltime record of November, 1937. Pig iron production was 761,100 tons, a loss of 22,700 tons from the 783,800 tons made in December. At the end of January 130 blast furnaces were producing, compared with 133 at the end of the year.

The situation in pig iron has eased and needs are being well supplied. Demand for steel deliveries is urgent, particularly from the shipbuilding and rearmament programs, which are requiring additional tonnages, above existing contracts. The export trade is quiet and demand for sheets and tin plate is dull.

The Continent reports little change, with slight revival in demand from the Argentine, Scandinavia and Central America. American competition is reported as still keen, particularly for plates. Prices are weak.

France has reduced the duty on export of scrap to 20 francs per 220 pounds. The former rate was 50 francs per 220 pounds, effective from Sept. 30, 1937.

Nonferrous Metals

Nonferrous Metal Prices, Page 80

New York—Continued lack of consumer buying last week coupled with a slightly easier tendency abroad, resulted in a quickening in the downward pace here in nonferrous metal markets. Lead dropped $8 per ton while zinc eased $5. In view of the curtailment of production and the steady decline in stocks at consumers' plants, market observers are watching for an upturn in demand which is likely to gain momentum quickly, especially if general business improves.

Copper—All producers continued to quote on the unchanged basis of 10.00c, Connecticut, for electrolytic. Export copper eased from 9.80c to 9.50c, c.i.f. The foreign market firmed on Tuesday due to a spurt in Wall street but weakened on the resumption of unfavorable news dispatches from this country. Sales during the past six months totaled only approximately 147,000 tons compared with sales of 148,089 tons for the single week ended July 25, 1936.

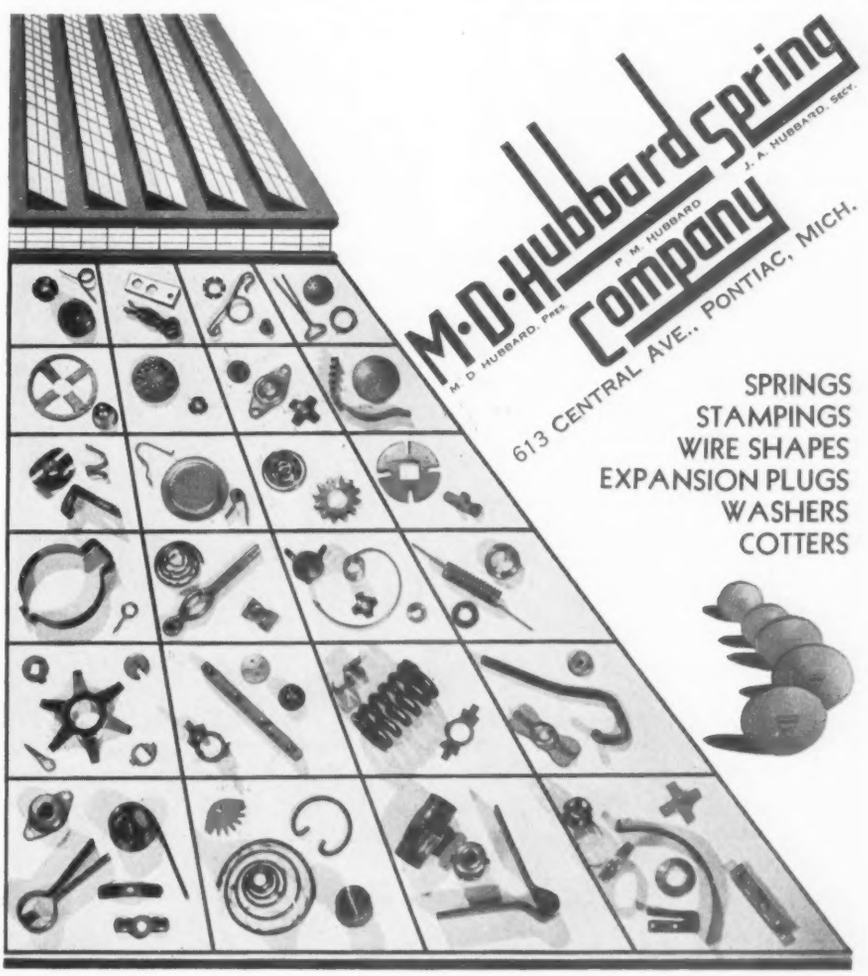
Lead—Prices declined $3 per ton Tuesday and $5 further on Thursday, bringing the quotation down to 4.50c, New York, and 4.35c, East St. Louis. The price cut failed to stimulate new business.

Zinc—Prime western zinc declined $5 per ton on Tuesday to 4.75c, East St. Louis. Weakness in the market reflected poor demand, lower prices in London, and an increase of 23,756 tons in refined stocks during January.

Tin—The domestic market held fairly steady in view of the usual wide price swings and continued sharp changes in London. Straits spot fluctuated between a high of 40.87½c and the low and closing price of 40.50c. Buying has tapered in line with the low rate of operations in tin plate mills, averaging around 35 per cent.

Antimony—Chinese spot advanced ¼-cent on Friday to 15.87½c, duty paid New York, while American spot held at 13.75c, New York. Chinese resale metal appeared on Friday at 13.75c, in bond New York.

Utica Radiator Corp., Utica, N. Y., has appointed the following as distributors of its air conditioning units: Wallace Stebbins & Sons, Baltimore; Macmann Engineering Co., Stamford, Conn.; Hart Air Conditioning Co., Union City and Maplewood, N. J.



Activities of Steel Users, Makers

(*Concluded from Page* 26)

recently to purchase and continue the ventilating equipment business formerly conducted by the industrial fan division, Bendix Products Corp. President and general manager of the new company is Marshall A. Smith Jr., formerly in charge of sales and engineering of the Bendix industrial fan division.

♦

Tool Equipment Sales Co., Chicago, has moved from 4625 Fulton street to new and larger quarters at 24 South Pulaski road.

♦

Hendrick Mfg. Co., maker of perforated metals, Mitco open steel flooring, decorative grilles and other products, has moved its Pittsburgh office to the Gulf building, room 744.

♦

Continental Roll & Steel Foundry Co., Pittsburgh, has just taken orders for constructing two complete three-high mechanized sheet mill units, one for Continental Steel Co., Kokomo, Ind., and the other for Superior Sheet Steel Co., Louisville, O.

♦

Globe Co., Sheboygan, Wis., formed in 1918 to manufacture furniture and other metal stampings, tools, dies and jigs, discontinued operations Feb. 1. If negotiations now under way for disposition of plant, machinery and materials are successful, the business will continue under new ownership.

♦

Smith Steel Foundry Co., Milwaukee, is installing a 1-ton arc melting furnace and accessories and additional laboratory equipment for control and development of new alloys, to facilitate the handling of orders for special high alloy steel castings.

♦

A talking motion picture has been made depicting processes of drawing high carbon rope wire and fabricating wire rope as produced by the Union Wire Rope Corp., Kansas City, Mo., for presentation before groups in the building and construction, mining, logging, oil and other industries.

♦

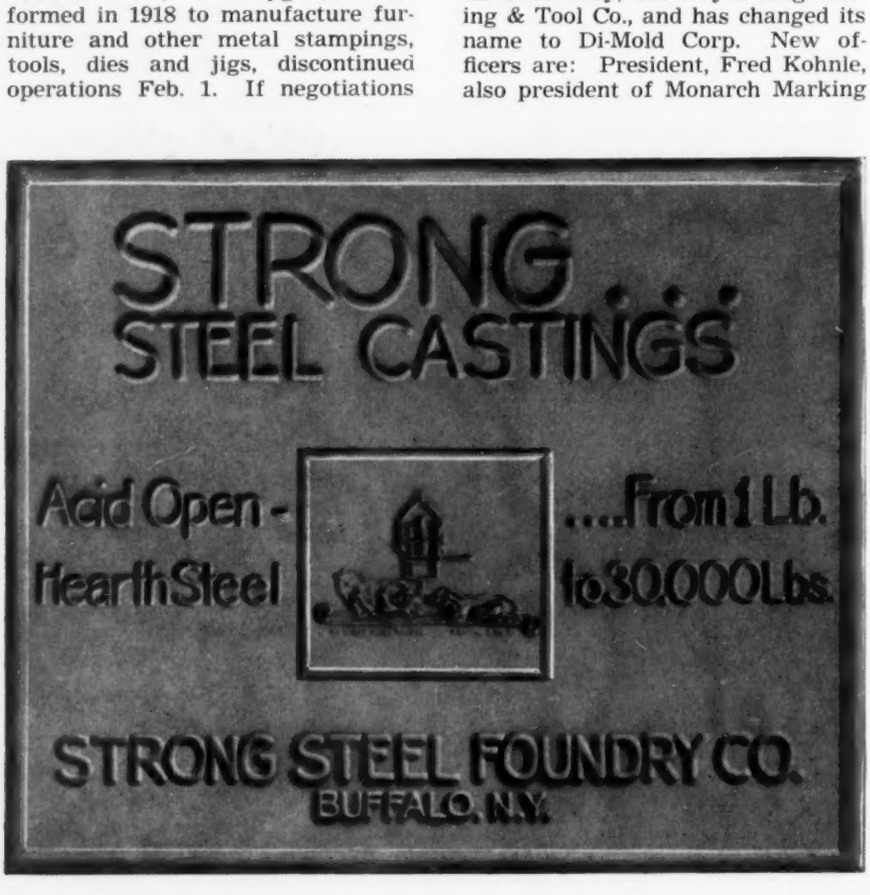
Lewis Foundry & Machine division of Blaw-Knox Co., Pittsburgh, has booked a contract for two balanced three-high rolling mills, equipped with automatic screw down, from Bengal Steel Co. Ltd. of India. This makes a total of 11 orders for three-high mills received in the past 12 months.

♦

Di-Mold Castings Co., Dayton, O., has purchased all the capital stock and assets of Molded Alloys Co. Inc., Dayton, including casting machines and complete toolroom equipment of its subsidiary, the Fryer Engineering & Tool Co., and has changed its name to Di-Mold Corp. New officers are: President, Fred Kohnle, also president of Monarch Marking System Co.; treasurer and general manager, R. E. Engle; secretary, Robert N. Lloyd; manager, Di-cast division, A. H. Witte; manager, Di-Mold division, Duncan Wilkie.

♦

A contract covering the sixth duplicate 84-inch vertical shaft, single-suction, screw-type centrifugal pump for Detroit's Conners creek stormwater pumping station has been awarded to Worthington Pump & Machinery Corp., Harrison, N. J. With this installation total installed capacity will approximate 2,000,000,000 gallons per day.



Equipment

St. Louis—The Gulf Coast Lines and the International-Great Northern railway, subsidiaries of the Missouri Pacific, have been authorized by the federal court here to make expenditures for improvements, equipment and tools exceeding $100,000.

Detroit—Ford has about concluded an extensive program of equipment buying for the new press shop now going up at the Rouge plant. Expenditure is estimated at close to $5,000,000 and covers a wide range of standard types of presses. First of this business was released about Jan. 1 and has continued since then.

Machinery sellers here also have been booking business for the Ford tool and die shop. Last week a number of millers, planers and other metalworking machinery were released and more are to come. A Cleveland builder is understood to be taking enough of this business to keep its plant busy the rest of the year.

New model programs are on the doorsteps of tool and die shops, which should result in further equipment needs. Fisher Body has placed large contracts in Toledo, Dayton and Philadelphia, and will follow up with a scattering of smaller releases for local shops. High labor rates in local die shops have worked against the receipt of some of the 1939 model work, especially the larger dies, but it is felt, in view of extensive changes being made in next year's models, there will be plenty of work for all local suppliers.

Nash likewise has awarded a fair volume of tool and die work. Chrysler divisions as yet have not released much, but should fall in line shortly.

Seattle—Inquiry for equipment indicates a better than normal season in Alaska fish packing and mining operations. Demand for road machinery is active while volume of electrical and pumping equipment has improved. WPA operations are calling for a miscellaneous list of items in small tonnages.

Construction and Enterprise

Pennsylvania

BOYERTOWN, PA. — Conestoga Telephone Co., J. K. Stoltzfus, general manager, plans installing modern dial and automatic exchange and system in Boyertown; also new line to Bally. Cost $25,000. Maturity soon.

PHILADELPHIA—Frankford arsenal, Philadelphia, receives bids to Feb. 18, invitation 314-38-683, for 6000 feet transmission cable, delivery Frankford arsenal.

PHILADELPHIA — Sun Oil Co., 1608 Walnut street, Philadelphia, plans installing motors and controls, conveyors, regulators, pumping machinery and other equipment in connection with expansion and improvements in oil refinery plants at Marcus Hook, Pa., and Toledo, O. Program to be developed as 1938 project. Cost $11,000,000.

ROARING SPRING, PA.—Borough is making plans for sewerage system and primary treatment sewage disposal plant, including sludge digestion tanks, imhoff tanks and covered sludge beds. Will apply to WPA for funds next month. B. A. Long, city hall, engineer. L. L. Gwin, engineer, and Hunter & Caldwell, Fifth avenue and Thirty-sixth street, Altoona, Pa., architects.

TYRONE, PA.—Borough plans sewage disposal plant in Blair county near here. Cost $150,000. R. A. Hagerman, Municipal building, Tyrone, burgess; J. Funk, Municipal building, Tyrone, borough engineer.

Ohio

BELLEFONTAINE, O. — City plans purchasing one 1000-horsepower boiler with stoker equipment for municipal water and light plant. F. M. Baxley, chief utility engineer.

CLEVELAND — Tremco Mfg. Co., W. E. Treuhaft, president, East 131st street and Taft avenue, will erect one-story factory. Cost $150,000.

WILLSTON, O. — City plans purchasing one 1000-kilowatt turbine for municipal light plant. Cost $20,000. J. H. Browne, director of public service.

WRIGHT FIELD, DAYTON, O.—War department, air corps, takes bids to 10 a. m., Feb. 18, for two pedestal type riveting machines for operation on 220-volt, three-phase 60-cycle alternating current, delivery f.o.b. contractor's plant; until 10 a. m., Feb. 21, for 13-inch and 16-inch tool room precision lathes, specification 50002-F dated Jan. 11, 1938, delivery Wright Field, Dayton, O.; until 10 a. m., Feb. 24, for 6600 feet of class 2 type A galvanized steel pipe, specification WW-P-403 dated Nov. 7, 1933, delivery f.o.b. contractor's plant.

Michigan

BIRMINGHAM, MICH. — City, J. E. Martz, mayor, plans election on bonds to finance new construction, including sewage treatment plant and pumping station. Cost $180,000.

DETROIT — Detroit Edison Co., 2000 Second street, H. G. Snow, controller, plans $18,000,000 expansion program. Generating equipment to cost $7,900,000; substation construction cost $1,800,000; includes other miscellaneous equipment.

FLINT, MICH. — City manager, and Shoecraft, Drury & McNamee, engineers, Savings Bank building, Ann Arbor, Mich., are working out details of city water softening plant to be submitted to WPA for approval.

LEXINGTON, MICH. — City plans waterworks system. Pate & Hirn, Michigan building, Detroit, engineers. $35,000 in bonds already voted.

NILES, MICH. — City council soon takes new bids for sewage disposal plant and sewerage system. Cost $300,000. Cole, Moore & Geupel, La Salle street, South Bend, Ind., engineers.

Connecticut

HAMDEN, CONN. — New Haven Paper Box Co., 214 East street, New Haven, plans installing electric power equipment in new paper box manufacturing plant at Welton and Burton streets. Cost $50,000. Charles H. Abramowitz, New Haven, architect.

HARTFORD, CONN. — Southern New England Telephone Co. plans extensions and improvements including $4,000,000 for new work and $4,000,000 for replacements in various locations.

Maine

LEWISTON, ME. — City, D. J. Levesque, mayor, city hall, receives bids March 1 for pumping station improvements in connection with new water pumping and electric power system. PWA project. Estimated cost $200,000. G. Z. Bernier, superintendent. Whitman & Howard, 89 Broad street, Boston, engineers.

Massachusetts

CENTERVILLE-OSTERVILLE, MASS. — Osterville fire district, C. H. Brown, chairman, is making plans for water system, including pump house, 19 miles pipe line, 160 hydrants, pumping equipment. Cost $435,000. Town voted $475,000 for the project. Whitman & Howard, 89 Broad street, Boston, engineers.

HOLLISTON, MASS.—Holliston Water Co. plans early rebuilding of main water pumping station on Washington street which was recently damaged by fire.

New York

NEW YORK — Bateman Die Cutting Co. Inc. was incorporated here with $20,000 capital to make steel dies and forgings. Jacob A. Singer, 105 Court street, Brooklyn, incorporator.

RICHMOND HILL, N. Y.—National Hardware Co., 161 Jamaica avenue, Brooklyn, will construct one-story factory building. Plans by L. Danacher, 161-19 Jamaica avenue, Jamaica, Long Island, N. Y.

TIVOLI, N. Y. — Village is making plans for constructing 150,000-gallon elevated tank. Also will install water pipe, sewer pipe and settling tank. Cost $90,000. WPA funds applied for. M. Vrooman Inc., 21 North Main street, Gloversville, N. Y., engineer.

Illinois

CHICAGO — Air Reduction Sales Co., 3101 Homan avenue, plans constructing factory at Thirty-first street and Homan avenue. Cost $40,000.

HIGHWOOD, ILL. — City plans municipal waterworks system. Bill introduced into congress asking perpetual easement on Sherman military reservation near here.

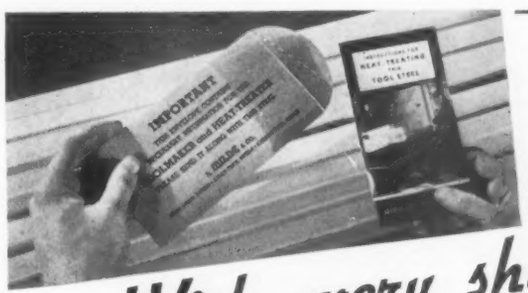
JOLIET, ILL. — Carnegie-Illinois Steel Corp., 208 North LaSalle street, Chicago, plans constructing wire mill on site at Collins and Meeker streets. Private plans.

RIDGEWAY, ILL. — City is making plans for waterworks and distribution system. Cost $45,000. Kinsey Engineering Co., 515 Court street, Pekin, Ill., engineer.

Indiana

KOKOMO, IND. — Indiana Steel & Wire Co. plans installing electrical power equipment in two new one-story plant additions. Cost $100,000.

KOKOMO, IND. — Haynes-Stellite Co., South Lindsay street, plans installing motors and controls, conveyors, regulators and other equipment in new two-



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story addition to metal products plant. Cost close to $100,000. Charles Ammerman, Century building, Indianapolis, consulting engineer. The company is a subsidiary of Union Carbide & Carbon Corp., New York.

Maryland

HURLOCK, MD. — Eastern Pickle Corp., Philadelphia, Pa., will build pickle plant here to grade 1500 bushels daily.

TOWSON, MD.—County commissioners of Baltimore county receive bids Feb. 21 for furnishing material, equipment, labor and construction of two sewage pumping stations, one in Essex and one on east side of Red House run at head of Bak river. Samuel A. Green, chief engineer, Baltimore county, metropolitan district.

Georgia

MOULTRIE, GA. — Colquitt County Rural Electrification Administration plans constructing 70 miles additional lines in Colquitt county and wiring for 200 customers. $85,000 funds allotted.

Tennessee

BRISTOL, TENN. — East Tennessee Light & Power Co. and Tennessee Eastern Electric Co. have combined, operating as one company plan expenditure during 1938, of $3000 for generation, $5000 for transmission, $138,000 for distribution, $4000 for general equipment for power systems.

CHATTANOOGA, TENN.—Welding Gas Products Co. Inc., care of M. E. White, president, 200 East Minnesota avenue, Knoxville, plans installing motors and controls, air compressors, conveyors and other equipment in plant at Chattanooga for producing industrial oxygen and other industrial gases. Cost $100,000. J. P. Williams, Chattanooga, vice president and general manager.

CHATTANOOGA, TENN.—Chattanooga electric power board, Harold C. Fiske, chairman, Kenneth Markwell, chief project engineer, power project section, 938 Volunteer building, receives bids March 7 for constructing subproject contract No. 1, 44-kilovolt lines from Chickamauga dam to substation No. 1, to substation No. 2, to substation No. 3, to substation No. 6, to Chickamauga dam. Cost $110,000. (Noted in STEEL, Jan. 24, 1938.)

Louisiana

SHREVEPORT, LA.—City, R. N. Allen, commissioner of public utilities, plans expenditure of $135,000 for improvements to waterworks and sewer system. H. Lane Mitchell, commissioner.

VILLE PLATTE, LA.—Rotary club and Young Business Men's club interested in proposed power plant. F. P. Joseph, engineer, Glenmore, La., compiled report.

West Virginia

HUNTINGTON, W. VA.—Appalachian Electric Power Co., 1003 Electric building, Richmond, Va., is having surveys made for extending power service in Wayne county, constructing 11-mile line from Echo to Genoa.

PARKERSBURG, W. VA. — City plans water softening plant to cost $40,000 and incinerator plant. Total cost $60,000. City council has appointed committee to investigate plans and costs.

WAYNE, W. VA. — John Dibella, Barboursville, will construct building seven miles north of Wayne for glass manufacturing plant. Will operate as Venetian Novelty Glass Co.

Virginia

BLACKSTONE, VA.—Southside Electric Co-operative, Charles S. Hooper, supervisor, has loan approved by REA for constructing 65 additional miles rural lines in Prince Edward and Charlotte counties, and is also authorized to construct lines in Mecklenburg county. Has allocation of $55,000.

NORFOLK, VA.—Moon Engineering Co. has been incorporated here with $50,000 capital to operate foundry and machine shop. W. F. Jordan, R. Arthur Jett, Citizens Bank building, incorporators.

Missouri

KENNETT, MO. — City will call for bids soon for extensions and improvements to municipal electric power plant, including installing two 400-kilowatt or three 350-kilowatt diesel engine generator units and complete accessory equipment. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., consulting engineer.

ST. LOUIS—Hygrade Water & Soda Co., 653 Tower Grove avenue, acquired building on Boyle avenue and Papin street and will convert into soft drink bottling plant.

Oklahoma

BLACKWELL, OKLA.—City will let contract March 8 for extension to municipal light and power plant to house new boiler and 4000-kilowatt turbine. Will call bids later for auxiliary equipment and necessary plant repairs. Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineers. G. F. Knisley and Theodore Bowman, Blackwell, will probably estimate. (Noted in STEEL, Dec. 20, 1937.)

Wisconsin

ANTIGO, WIS.—City council has engaged Jerry Donohue, Sheboygan, Wis., as consulting engineer for new water treatment plant and rehabilitation of waterworks pumping station. WPA project, S. B. Byrne, city clerk.

BEAVER DAM, WIS. — Simplex Inc. has been incorporated here with 2000 shares no par value common stock and $50,000 worth preferred stock to reopen foundry and machine shop of the former F. Rassmann Mfg. Co. here. Will produce gray iron castings. Incorporators are H. L. Kirch, J. D. Hopkins, H. A. Petraska.

MARSHFIELD, WIS. — City water and light commission has commissioned Helmick, Edeskuty & Lutz, Essex building, Minneapolis, to supervise extensive improvements and additions to city power plant. George Marvin, manager.

MERRILL, WIS. — Public Utility Engineering & Service Co., 231 South LaSalle street, Chicago, soon lets contract for substructure for intake structure and spillway for powerhouse, including turbines, generators, and equipment at Grandfathers Falls near here.

Minnesota

MADISON, MINN.—City council, J. H. Hayden, city clerk, has decided to purchase steam engine being used in power plant at Valley City, N. Dak., as an auxiliary steam unit, and will also purchase diesel unit for power plant in the open market. City will issue $132,000 in bonds to finance purchases.

MINNEAPOLIS — Board of commissioners, Hennepin county, A. P. Erickson, auditor, plans drilling well at north end of Long lake, furnishing, installing pumping equipment and raising level of Lake Minnetonka. Cost (not official) $20,000. A. F. Meyer, 628 Metropolitan Bank building, Minneapolis, engineer.

MOORHEAD, MINN.—Temporary organization has been formed to establish rural distribution system for Clay, Norman and Polk counties. P. O. Johnson, Moorhead, is interested in plans; 325 customers have signed for service and application will be made soon to REA for loan to finance construction.

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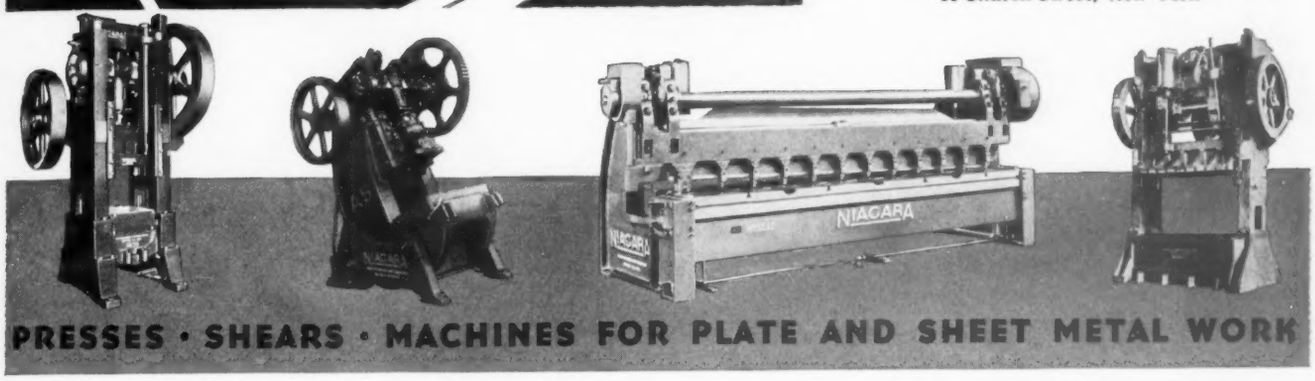

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TORRINGTON · · · CONNECTICUT

ROCHESTER, MINN.—Peoples Co-operative Power Association of Olmstead County, Jay J. Carroll, secretary, is taking bids to 2 p. m., Feb. 23, for constructing a substation and underground feeder to be financed by REA loan. Ellerbe & Co., First National Bank building, St. Paul, consulting engineer.

ROCHESTER, MINN.—Peoples Co-operative Power Association of Olmstead County, Jay J. Carroll, secretary, is taking bids to 2 p. m., Feb. 23, for constructing approximately 153 miles rural transmission lines in Olmstead and Dodge counties. Ellerbe & Co., First National Bank building, St. Paul, consulting engineer.

RUTHTON, MINN. — Village voted $8000 bonds for drilling well, furnishing and installing pumping equipment. Druar & Milinowski, 830 Globe building, St. Paul, engineer. PWA project.

Texas

COLEMAN, TEX.—Coleman County Electric Co-operative Inc., C. W. Pitts, president, receives bids Feb. 23 for approximately 101 miles rural power line in Coleman county. William G. Morrison, 912 Professional building, Waco, Tex., engineer. (Noted in STEEL, Feb. 7, 1938.)

DALLAS, TEX. — City, care of H. Mesley, city manager, takes bids March 1 for sprinkler filters for sewage plant. Cost $100,000. A. P. Rollins, director of public works.

HOUSTON, TEX.—Adolphus Rice Milling Co. Inc., A. L. Pfeffer, president, 1607 Hemphill, acquired site in 3900 block on Clinton drive for erecting $100,000 rice mill. Work to start soon includes three buildings, all attached, including mill, power house, and warehouse. Will be operated by diesel engine. (Noted in STEEL, Jan. 24, 1938)

KAUFMAN, TEX.—Rural Electric Co., W. W. Baird, secretary, receives bids about Feb. 15 for approximately 250 miles of power lines. Applied for $250,000 REA funds. Hawley, Freese & Nichols, Capps building, Ft. Worth, engineers. (Noted in STEEL, Jan. 10, 1938)

LIBERTY, TEX.—City, Tom Calhoun, mayor, will release plans for bids about Feb. 26 for power plant building, three 150-kilowatt generators, power plant switchboard, equipment, wiring and complete distribution system. Garrett Engineering Co., Box 1726, Houston, engineer. (Noted in STEEL, Feb. 7, 1938.)

RAYMONDVILLE, TEX. — Herring Bros. are erecting cotton gin, plan installing modern equipment.

SEGUIN, TEX.—Texas Hydroelectric Corp. will spend $18,000 for construction during 1938.

South Dakota

FLANDREAU, S. DAK.—Bond issue of $158,000 was approved at recent election to finance purchasing power plant and distribution system. City will purchase two 375-horsepower diesel engines and generators. Carl Hanson, city auditor. (Noted in STEEL, Jan. 10, 1938)

Iowa

BURLINGTON, IOWA — Chicago, Burlington & Quincy Railroad Co., 547 West Jackson boulevard, Chicago, plans installing motors and controls, conveyors, electric hoists and other equipment in connection with expansion and improvements in car and locomotive shops at Burlington. Cost estimated close to $1,000,000.

CLINTON, IOWA—E. I. du Pont de Nemours Co., care of J. L. Warner, Wilmington, Del., has purchased site and will erect five-story cellophane plant, three-story office building, and one-story power house. Total cost $14,000,000.

ONAWA, IOWA—City, J. H. Riordan, city clerk, is taking bids to 10 a. m., March 2, for general construction improvements at power plant, consisting of removal of floors and supporting structures; new concrete engine foundation; steel fuel oil storage tank; one 625-horsepower diesel engine with equipment; two switchboards; and cubicles with equipment. Estimated cost $60,000. Buell & Winter Engineering Co., Sioux City, Iowa, consulting engineer.

POLK CITY, IOWA—City will vote in March on bond issue election to match federal funds to finance constructing complete new waterworks plant.

Nebraska

BLAIR, NEBR.—City is taking bids to 2 p. m., Feb. 16, for one internal combustion engine generator unit for municipal power plant. Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineers. (Noted in STEEL, Jan. 31, 1938)

FAIRBURY, NEBR. — City, Elsie Schnuelle, city clerk, has received an allotment of $7500 from WPA to aid financing constructing various improvements to municipal light and power plant and to distribution lines.

GRAND ISLAND, NEBR.—City has made application to WPA for funds to finance cost of reconstruction and various repairs at city water and light plant. Cost $68,300. E. T. Seeley, city engineer.

HARTINGTON, NEBR. — Nebraska state railway commission has granted permission to Cedar-Knox County Rural Public Power District, Julius Tigges, president, to construct 180 miles rural transmission lines in Cedar and Knox counties. Cost $200,000. H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha, consulting engineer. (Noted in STEEL, Nov. 29, 1937)

LINCOLN, NEBR.—Lancaster County Rural Public Power District has filed application with state railway commission for permission to construct 143 miles rural transmission lines in Lancaster and Otoe counties.

LINCOLN, NEBR.—Lincoln Telephone & Telegraph Co., J. H. Agee, general manager, L preparing plans calling for expenditure of $950,000 during 1938 for new construction, $750,000 of this amount to be used for improving the Lincoln exchange.

ST. PAUL, NEBR.—Nebraska state railway commission has granted permission to Howard County Rural Public Power District to construct a 10-mile 34,500-volt transmission line to connect project with Sutherland substation at Grand Island, Nebr. James Fisher Jr., Elba, Nebr., district secretary. H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha, consulting engineer.

WEST POINT, NEBR. — Cumming County Rural Public Power District, Claude Galbraith, president, has filed application with state railway commission for permission to construct 230 miles rural transmission lines in Cumming, Burt and Stanton counties. Midwestern Engineering Co., 2408 West Second street, Hastings, Nebr., consulting engineer.

Idaho

BOISE, IDAHO—Amalgamated Sugar Co. of Utah plans five sugar beet factories in the Boise valley, including a large plant at Nyssa, Oreg.

LEWISTON, IDAHO — Clearwater Valley Power & Light association, T. C. Smith, chief engineer, will call bids soon for 1700 meters in connection with 600 miles distribution line now under construction.

WALLACE, IDAHO — Sunset Brewery plans expanding plant including additional machinery and equipment.

Pacific Coast

LOS ANGELES — Construction was started in mid-January on group of factory buildings for Standard Battery Separator Co. at 4401 Sheila avenue, Los Angeles. Cost $100,000.

SAN BERNARDINO, CALIF.—A new garage and warehouse will be erected here for General Motors Corp. Cost $80,000.

SAN FRANCISCO — Market Street Railway Co., 58 Sutter street, plans spending $578,000 on improvements during 1938.

SAN PEDRO, CALIF.—General Petroleum Corp. is erecting a new heater building at 418 Henry Ford avenue, San Pedro. Cost $8600.

TORRANCE, CALIF.—General Petroleum Corp. will add facilities to its refinery plant here, including buildings, tanks, boilers, and pumps. Total cost $1,732,000.

DRYDEN, WASH. — City has been granted $16,514 WPA allotment for constructing sewerage system and disposal plant.

SEATTLE — Seattle Brewing & Malting Co. plans to spend $150,000 in remodeling adjoining plant of Apex Brewing Co. which has just been acquired. Emil G. Sick, president.

SEATTLE — Packers Service Inc., with capital of $20,000 has been organized by R. H. Corbett and associates, 1211 American Bank building, to engage in machine and appliance business supplying fish canneries.

SHELTON, WASH. — The Austin Co. has contract for constructing powerhouse addition to plant of Simpson Logging Co. in which new turbines will be installed.

Canada

LONDON, ONT. — Utilities commission, London, plans improvements and new equipment for electrical system, including electric meters, $10,000; extensions in downtown area, $4000; cable and circuit breakers, $2000; equipment for electric water heater control, $20,000; water cooling equipment for transformers, $2000; small transformers, $6000; miscellaneous equipment and underground work, $6000. Total project cost $75,000. E. V. Buchanan, London, engineer.

OTTAWA, ONT.—Gatineau Power Co. has applied to provincial electricity board of Quebec for approval of plans to spend about $750,000 in 1938 for additional generating and transmission line capacity, to be financed out of earnings and cash.

REGINA, SASK. — Council plans sewage disposal plant. Cost $150,000. A. C. Ellison, city hall, engineer.